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CONDUCTED BY

H. H. STATHAM,

FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

"EVERY man's proper mansion-house, and home, being the theater of his hospitality, the seate of selfe-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kind of private princedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

"Architecture can want no commendation, where there are noble men, or noble mindes."—SIR HENRY WOTTON.

"OUR English word To BUILD is the Anglo-Saxon Bŷlδan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."—DIVERSIONS OF PURLEY.

"ALWAYS be ready to speak your mind, and a base man will avoid you."—WILLIAM BLAKE.

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English Architecture of the last Half Century.

IN commenorating the fiftieth anniversary of the existence of this journal, it is natural to look back and consider the achievements and the progress of English architecture during that period; a period which, if architectually speaking it has been uncertain, varying and divided with its aims, has nevertheless been one of great activity and energy in building; which has seen the production of some of the most important English buildings of the modern era, besides a host of smaller buildings many of which, considered singly, have been of great architectural merit, and which taken collectively represent a very remarkable total of architectural achievement.

Several causes have combined to promote architectural enterprise during the past half century. In regard to our great public buildings, those of national importance especially, we have been in a state of transition. While the machinery of Government in these modern days has become more and more complicated, the old buildings which had served their purpose somehow during the previous century had become more and more palpably insufficient for the accommodation demanded. The fire which in 1834 destroyed the old Houses of Parliament probably only hastened by a few years a rebuilding of the palace of legislature which must have been very soon recognised as a necessity of the times. Indeed, those who are acquainted with the illustrations of the Houses of Parliament as they existed just previous to the fire may well wonder how we had managed up to that period to be content with such miserably inadequate buildings, whether considered practically or architecturally; buildings with no kind of architectural dignity, and planned like a rabbit warren. Following on the rebuilding of the central home of legislature arose naturally the ambition to provide more suitable and more centralised accommodation for the great official departments connected with the Government service, and hence arose the competitions for new Foreign Offices, War and Admiralty offices (the latter abortive in a great measure), and for rebuilding and centralising the Royal Courts of Justice. Provincial towns caught the spread of the movement; they would also have their municipal life architecturally illustrated, and hence the successive springing up of the large town halls and municipal offices, which is still going on. Concurrently with this spirit of renovation in Government and municipal concerns, came the spirit of church revival, shaking up a church and church-going people from their long placid acquiescence in the unpicturesque church and perhaps rather somnolent ecclesiastical life of the early part of the century; holding before them the Mediæval idea of passion aspiration and passionate mysticism, and leading them to desire the erection of buildings more in accordance with the new spirit which had entered into the national church. Whether this ecclesiastical revival was either in an intellectual or in a spirital sense an unmixed good — there are those who still think it an unmixed evil—is a point which we are not bound to consider here; we are only concerned with its effect upon architecture, which was indubitable. New churches, intended to emulate the spirit of the Mediæval

buildings, with due regard to necessary economy ("say thirty shillings more and have a tower and spire at once," as Pugin once wrote to a church committee), sprung up everywhere, and this modern phase of English feeling has left its architectural mark over the length and breadth of the land. For with the sympathy for Mediæval faith came the sympathy and even passion for Mediæval architecture, which ruled for some forty years in the land: it is perhaps difficult to say which feeling arose first; no doubt each reacted on the other; but in all probability the revival of Mediæval church architecture was mainly due to the revival of Mediæval religious feeling; the two things are connected together, just as the revival of Queen Anne architecture is connected with that reflux of feeling which has created of late years a new sympathy for the literature and thought of the formerly much-reviled eighteenth century.

The new interest in house and street architecture, which is a prominent feature of the last twenty years, it is not so easy to account for. It is probably to some extent the result of the education of taste in regard to matters of decoration and furniture, which has been gradually progressing in this country since the 1851 exhibition; an exhibition crowded with objects of what we should now think the most vulgar taste, but which nevertheless was the starting-point of a new era, a suggestion of the idea that the national cultivation of taste in decorative art was an object worth striving for, and which paved the way for the Kensington Museum and much "culture." It may not follow necessarily that those who have learned to appreciate a good style of design in furniture and decoration should be desirous to have the exteriors also of their houses decorative, since we know that in the last century it was not so. The great square lump of Lord Carrington's house, for instance, till recently facing the Horse Guards, had nothing architectural to commend it externally, yet it contained the most charming and refined interior decoration, as was the case with many other eighteenth century London houses. The fact perhaps was that in that period the outside of the house was not thought of much importance in an architectural sense; it was the weather screen only, and the artistic amenities were reserved for the interior; the house, in fact, was regarded only as an interior. Now, we have arrived at a perception that a house exterior is worth thinking of, both for one's own pleasure and that of one's neighbours, and there is no department of architecture, on the whole, in which the recent development has been so marked and so satisfactory, as it has been in street architecture.

At the commencement of the half century on which we are looking back, the taste for a somewhat cold and correct style of columnar architecture for public buildings was still surviving; it has in fact in a measure survived ever since in a spasmodic way, for though we have seen a more château-like style adopted for recent public buildings, the picturesque superseding the Classical, yet from time to time a large town-hall or other such edifice is still built in which the architect has nothing more to offer us than the Greek or Roman columns and Italian details which were in the earlier part of the century considered *de rigueur* for public buildings and banks and other such institutions. At the time we refer to, Sir William Tite, that most typically respectable of respectable architects, had just completed the Royal Exchange; much admired at first, grumbled at soon afterwards by those who most used it, as witness our own columns in the following year, under the heading "The Royal Exchange and its defects." The defects were draughts and discomfort of various kinds, and a prayer was expressed that the central area might be covered in; a wish now realised, though not till forty years or more after the building was erected. Burlington House was still *in statu quo*, with its single story and its massive gateway and colonnade, now going to spoil on the river bank at Battersea. Montague House was in process of being used and partially transformed as the British Museum, the heavy panelled screen-wall and gateway still flanked Great Russell-street, where the lofty gilt railings now are. It was not till five years into our half-century (1847) that Sir Robert Smirke carried out the columned front of the Museum as we now see it; a design which is so far apart from the architectural taste of the era to which it belongs that one is always tempted to imagine the British Museum older than it really is; it seems distant from us, architecturally, by a good deal more than half a century. It was, in fact, a survival from an earlier period, by an architect who retained the academical tastes of the old school. Useless as the colonnade is, however, it imparts a certain classic dignity to the building, and a well-known artist living opposite to it, who chiefly concerns himself with the painting of architecture, declares that those columns, seen under various lights, are a constant source of pleasure and interest to him. Indeed the fact that a Classic colonnade is an anachronism does by no means prevent it being a very agreeable object to the eye—if we have not too much of it.

But while respectable academical architects were still finding an innocent pleasure in colonnades, a great national building was being commenced in a very different style. The Houses of Parliament is rather an exception, however, in regard to its style, which was not due either to the work of the architect or to the general or popular taste of the day, but to a bureaucratic decree. The Gothic movement had commenced before the competition for the Houses of Parliament, and its early development showed a certain predilection for Perpendicular architecture, as in the gimcrack plaster sham Gothic churches of Rickman and others, but there would have been no public expectation that the Tudor style should have been adopted for the Houses of Parliament, and certainly Barry would never have adopted if it left to himself. But it was ruled that the style was to be Gothic or Elizabethan—Late Gothic being probably intended—from a tacit feeling, apparently, that these were styles essentially English and connected with a great period of English history. Barry's predilections were all Italian, and Bridgewater House and the Reform and Travellers' Clubs (the first-named commenced nearly at the beginning of our half-century), exhibit his natural predilections as an architect. We have had an unfortunate habit of officially fettering the taste of our architects in regard to more than one national building, and probably Barry would have done better with the Houses of Parliament had he been allowed to treat it in his own way and in his own style. But, making allowance for these disadvantages, and for the frittering of the surface of the building by repetitions of small detail, we must hold that it is a building in the main worthy of the nation and of its purpose.

At all events opportunities for the architectural treatment of great national buildings have produced nothing equal to it since. One or two great opportunities we have had, but they have either been thrown away through the mismanagement or false economy of the Government, or the architects employed have not succeeded in making the most of the occasion. The next great opportunity to the Houses of Parliament—viz., the Foreign Office competition, occurred in 1856-7. There was as much public interest excited by this as by the Houses of Parliament competition. The 218 designs sent in were exhibited in Westminster Hall in 1857, and we find it noted in our columns that it was estimated that 10,000 people visited them on the first day of the show; a curious contrast to the public apathy with which competitions are usually regarded now, but unfortunately there have been so many competition *fiascos* that people have ceased to expect much from a great architectural competition now. Some fine designs were sent in, but the result was a curious kind of shuffling of the cards, whereby the first premiated design by Messrs. Coe & Hofland was afterwards set aside in favour of an Italian Gothic design by Scott, and this again set aside because Lord Palmerston, then in office, chose to act as arbiter of æsthetics also, and ruled that a Gothic Foreign Office could not be allowed. The Classic design which Scott produced (against his own principles) is poor enough, and an attempt was made to change the decision of the Government when the question was discussed in the House of Commons (July 8, 1861), when Mr. Cowper addressed the House in a speech which was more humorous than he was aware of, the substance of his argument being—"Why, *all* public buildings, in all respectable cities, are Classic or Italian; therefore, how *can* we have a Gothic Foreign Office?" And so ended this curious and unfortunate episode, leaving us a poor building designed by an architect working against his will and at the command of a Prime Minister who would meddle with things that he did not understand. A still greater opportunity was lost, however, in connexion with the Foreign Office scheme, for Sir Charles Barry exhibited in Westminster Hall at the same time a splendid plan for the collection of all the Government offices in one vast group of buildings extending from Great George-street to the Horse Guards, and facing on Whitehall and on St. James's Park, with communication through, and open colonnaded courtyards. This would have been a scheme really worth carrying out—one of the greatest architectural opportunities any city ever had; now only one of the architectural "might-have-beens."

In 1863 came the next great chance for national architecture, in the Law Courts Competition, this time a limited competition, which also attracted great public interest. Here again there was a kind of shuffle of the cards, for E. M. Barry won the competition for plan and Street for design, and they were appointed to work together; the result being that Barry was pushed out. The Law Courts, as a Gothic public building, is a curious contrast, in its sturdy and rather grim style, to the Gothic of the Houses of Parliament; a contrast indicative of the path of the Gothic revival, which in the main has been still from the later towards the earlier styles, ending with a preference on the part of many for Transitional work. The persuasion seems, however, to have forced itself on the world at last that early Gothic is not the style for modern life, and the Law Courts is probably the last public building of any importance, which will be built in pure Gothic style. The same change of feeling may be noted in domestic architecture. Mr. Burges's early Gothic house, built for himself, with its curiously piquant furniture and decorations, is still an interesting relic of the period, but no one would do that kind of thing now.

The Law Courts competition is memorable for the amount of power, talent, and originality displayed in the drawings as a whole. The design of Burges will not be forgotten by those who studied it at the time, and others in the set showed a remarkable degree of talent and originality; it may be doubted whether any similar competition at the present moment would give us a collection of designs of equal power. Certainly the next Government competition did not, that for the War and Admiralty offices in 1884. On the contrary, with one or two exceptions, what struck one in general was the poverty and commonplace character of the designs. But both the public and architects had begun (from experience) to distrust these great competitions, and neither did the public come to see the drawings nor did the leading architects (for the most part) compete. This want of public interest was again shown in the case of the limited competition for the Imperial Institute, which excited little attention, and where the designs

were not a remarkable set; but the one selected was certainly the best, and is an appropriate culmination to the work of an architect who has made a style of his own. Here, as in the Law Courts, the executed design is a landmark of the progress or change of architectural taste: each of these buildings representing the architectural taste predominant at the time the competition was held.

Among the prominent public buildings of the municipal class considerable interest attaches to the one which resulted from the competition for the Manchester Assize Courts in 1858, gained by Mr. Waterhouse, and forming the first of a series of large buildings connected with his name, all marked by admirable planning and by a treatment of Gothic materials specially his own, and which may be said on the whole to be eminently municipal in character. The most typical Gothic municipal building of the period is perhaps the Manchester Town Hall, carried out by the same architect about ten years later. In 1854 St. George's Hall at Liverpool was approaching completion; one of the last of the great columnar buildings of the period, but distinguished from such examples as that of the British Museum by the element of originality in the treatment both of masses and details which characterises it, and by a really new treatment of portions of the exterior in the shape of a kind of translation of Egyptian architecture into Greek. Its architect, Elmes, was a man of true architectural genius, who had he lived would have no doubt vindicated a claim to be considered as the fourth really great architect of this country since the Renaissance—Inigo Jones, Wren, and Barry being the three others. In 1861 the Halifax town hall, designed by Barry, is notified as approaching completion under the direction of his son E. M. Barry; a Classic building of fine design and distinguished by a highly original and successful application of the feature of the spire to Classic architecture, far more successful certainly than Nash's well-meant attempt in All Soul's, Langham-place. In 1862 occurred the competition for the Birmingham Exchange Buildings, not a very important one, and about the same time was carried out Scott's town hall at Preston, of the second class in point of size, but one of the best and most original in design of the Gothic town halls. In 1871 we had the important competition for the Birmingham Municipal Buildings, in which a good deal of talent was displayed, and which is memorable for the splendid plan sent by the late Mr. Lynn of Belfast, a plan which, as evidence of architectural genius, was worth all the rest of the designs put together. Unfortunately the design sent in with it was quite unfinished, and though the corporation purchased the plan, no use was made of it, and in the result the selection fell on a very commonplace design, which is no credit to Birmingham. The Leeds Municipal Buildings competition, in 1876, was gained by Mr. Corson, who produced a well planned building of rather heavy and unattractive Classic architectural style. The Glasgow Municipal Buildings, won by Mr. Young in a competition in 1882, was an important work, and a good application of Classic features, though not a very interesting building in proportion to its scale and the liberal amount spent on it. The Birmingham Law Courts, won in a competition by Messrs. Aston Webb and Ingram Bell in 1886, and but recently finished, is one of the most original and picturesque buildings of this class in recent times, though the elaboration of terracotta ornamental detail has to our thinking been carried too far. The competition for the Edinburgh Municipal Buildings in 1887 promised to be of the greatest interest on account of the splendidly picturesque site, and was gained by Messrs. Leeming with a plan which was a model of its kind; the design, however, did not come up in interest to the plan. Unfortunately the whole scheme fell through, the Edinburgh authorities not having apparently made up their minds before advertised the competition. The last of the large Municipal competitions has been that for the Sheffield Municipal Buildings, gained by Mr. Mountford, under whom the building is now in progress. It furnishes an example of the same kind of tendency in modern architecture as that displayed in the Imperial Institute, and which may be defined as the use of details mainly Renaissance in character, but with a grouping and feeling essentially Gothic.

The largest public building now in progress is the great scheme for the completion of the South Kensington Museum, long left an unhappy object with ugly temporary brick walls in front, but which is now to be completed, according to Mr. Aston Webb's design, in a manner which will produce a building worthy of the site and of the important object to which it is devoted.

A building which may claim notice is the Oxford Museum, of Messrs. Deane & Woodward, won by them in a competition in 1854, for it was typical of the then feeling of the Gothic revival. The artistic "Young England" of the day was vastly interested in it; it was to be a revival of true Mediæval art; enthusiastic words were spoken concerning the carvings, which the impassioned artisan was to carve after his own fancy from the flowers of the fields, as in the middle ages (so we were told). Alas! where has all this gone now? The enthusiasm has flown. The work is no longer admirable to the hypercritical eye of the present day, and the impassioned artisan is chiefly enthusiastic about the eight hours day.

We have referred to the great church building work of the earlier part of this half century. Some of the most typical buildings in this class are not the largest. Many of us can remember the interest which was aroused at the time (1861) by Street's small church of St. James the Less in Garden-square, so new in style (in this country) at the time, and showing a practised hand in the treatment of the style. Four years earlier Burges's successful competition design for the memorial church at Constantinople was another landmark, and still more decisively, two or three years earlier, Mr. Butterfield's All Saints, Margaret-street, which may have had some factitious importance owing to its being one of the head quarters of the new movement in the church, but which, along with other churches by the same architect, has held its own amid the changes of fashion much better than most of the Gothic church work of its day, even than that of Scott, whose mere revival of Gothic detail, however well done, looks somewhat *passé* now, whereas the touches of originality in Mr. Butterfield's work preserve its interest. Street's churches have also left their mark very decidedly in modern Gothic architecture (we were about to say "church architecture," but in fact all church architecture, practically, is still Gothic with us), and are the most permanently valuable work which he has left. He had a remarkable faculty of imparting dignity and apparent spaciousness to a comparatively small church. His completion of Bristol Cathedral deserves note as the only example of the completion of one of our Mediæval cathedrals in modern times. Of course, another great feature of the time has been the church and cathedral restoration movement; carried out amid universal enthusiasm at first, now only to be attempted amid the outcries of enraged archæologists; so curiously does fashion in these things turn about. It may be said that the church restoration movement deserved neither all the enthusiasm with which it was started nor all the opprobrium cast upon it now. Scott undoubtedly robbed some of the cathedrals unnecessarily of the charm of antiquity, and turned them out practically new buildings; but he also discovered and elucidated many points in their history, while the renovation of their interiors was simply a work of necessity and order, if they were to be regarded as buildings for practical use as churches. The competition for the proposed Liverpool cathedral in 1886, was an important architectural event which excited much interest, but has so far ended in nothing.

A prominent characteristic of the architecture of the period in late years has been the increasingly frequent erection of very large hotels, in a constantly ascending scale of magnitude. The influence of this class of erections on architecture has been mostly very bad; they are generally built in a hurry, and aim at no architectural expression beyond that of a certain showiness of exterior. Even Scott's St. Pancras Hotel, about which much was thought at the time, as a new departure, the treatment of a hotel by the leading Gothic architect of the day, is no longer looked upon with admiration; it is better than some other large hotels, but its detail is now felt to be too florid and *prononcé*. The really fine and suitable treatment of a railway station façade is a thing yet to be done. The club architecture of the period has also been a somewhat important element. Little of it is previous to our half-century; several of the Pall Mall clubs come into our "half-century," others, as the Reform, only preceded it by two or three years. The more recent clubs, like hotels and houses in flats, have become in these days much more lofty, and are treated in a much more elaborate manner architecturally. Some of the club-houses of this type, such as the National Liberal and the Constitutional, are undoubtedly more calculated to assist the picturesque effect of street architecture than the old style of Italian *palazzo* buildings which line Pall Mall; but they have the architectural defect (which they share with the modern style of residential blocks) of being in many cases too lofty for the width of the streets they occupy (a great mistake in house architecture, of which Victoria-street is a flagrant example), and it may be questioned whether, apart from this, they are really such dignified buildings, or so suitable to the architectural expression of a club, as the buildings of the type shown in the Reform, the Carlton, or the Army and Navy Clubs.

There is no class of architecture which has made such unquestionable and satisfactory progress during the half-century as the street house. In fact, at the commencement of our period, it could hardly be said that anything worth calling street architecture existed in our modern cities. Now, in some of the new parts of London especially, it is the most satisfactory architecture of all. In place of bare cement or brick fronts, with a few oblong holes in them, we have now a large class of new houses which are picturesque and tasteful in their architectural treatment without being pretentious. Even in shops and business buildings we now often find a most decided effort to give picturesque effect to the street front; we publish one example in this number, of some shops at Chelsea by Mr. F. G. Knight, illustrated by one of his own drawings. In some instances buildings of this class rise to a very high quality of architectural picturesqueness, as in Mr. Norman Shaw's charming building at the foot of St. James's-street, which Mr. Brewer has sketched in the foreground of his panoramic view of some of the buildings of the half-century, issued with the present number.

In this panorama, to which we may now refer the reader, Mr. Brewer has arranged in a very masterly manner (as we think everyone will admit) more than seventy among the leading English buildings of the last fifty years, grouping them on either side of a river, which serves both to divide the composition and to afford the opportunity of introducing sketches of the three Thames bridges built during the period; Putney Bridge, by Sir J. Bazalgette; Westminster Bridge (Sir Thos. Page) and Blackfriars Bridge (Henry Cubitt and Joseph Carr). Of these three bridges we may observe that Putney is far the superior in an architectural sense; West-

minister was carried out in a kind of bastard Gothic (probably with the idea of harmonising with the Houses of Parliament), and Blackfriars is defaced by the enormous and absurd granite columns on its piers, which carry nothing at all. The Albert Hall is placed in the centre of the composition not so much on account of its architectural importance as because it comes very well into the composition in that place. The Albert Memorial comes in its actual position in front of the Hall, and may very well claim that central position on other grounds, for, in spite of a certain degree of over-elaboration and incrustation of ornament, it deserves to rank as a remarkable work in decorative architecture, and was considered by Scott himself as his most important and central work. The other buildings, a few of which have been referred to in the course of this article, will be easily identified by means of the key-plate which Mr. Brewer has furnished, and which will be found, with the index of names, on page 12. To the architects of various buildings which might have had a good claim to be included and which are not to be found here we will only say that the difficulty of selection has been very great, and that we would gladly have included many more had it been in any way possible to find space for them. As it is, the group we believe forms a fairly representative collection of some of the most remarkable buildings which the architectural requirements of the last half-century have called into existence in this country.

NOTES.

A WORD may be said here as to the first establishment of this Journal, which has now entered upon its fifty-first year. The first number of the *Builder*, which, as we have already said, bore the date of December 31, 1842, consisted of sixteen pages, of which eleven were devoted to advertisements. It contained no illustrations except a few wood blocks, chiefly connected with advertisements. It was described as a "precursor number," issued to test the demand for such a journal. The Editor was Mr. J. A. Hansom, an architect born at York in 1803, and who was architect of the large church of St. Philip Neri at Arundel, built for the Duke of Norfolk, and of various other buildings, a list of which we gave in a memoir of him published at the time of his death in 1882.* He was also the inventor of the form of cab known by his name, which has thus at least a chance of being immortalised in history. The paper was at first issued at the price of 1½d., stamped 2½d.; and it is curious to note that although this journal has been through its whole career, after the first year or two, emphatically a paper for architects and those interested in architecture (builders of course included), it was actually started by Mr. Hansom as a builders' newspaper and magazine, under the impression, distinctly stated by him in the opening article, that there must be a field for a paper devoted to so large an industry as that of building. Mr. Hansom professed, indeed, from the first, that—

> "In designing our paper, we use the word *Builder* in its most extended sense. Instancing a house or other edifice, we regard it from the procurement and preparation of the materials to the fixing upon its site, and to its full completion for the residence, use, and enjoyment of man, and which includes the making of the design or plan, 'breaking ground,' as it is termed; the erection, or building up; decorating, fitting, and furnishing; the supply of water and drainage; and even the laying-out of the garden, pleasure-grounds, and park. This is the whole art of building, or, in other words, of providing and perfecting human habitations. To all, therefore, who are engaged in the art so defined, we address ourselves without distinction, and without preference; the interests of all will, to the best of our power, be consulted, promoted, and advocated."

Thus the extended sense in which the title of the paper is to be read was in great measure anticipated in the first number, in spite of its nominal dedication to the builder and contractor; and the architectural element in it very soon got the upper hand; and the real scope of the paper was further indicated when Mr. Godwin became editor, by the addition to the title-page in 1846 of the two first of the quotations which still stand there, and in 1847 by the addition of the still more pointed quotation as to the real meaning of the Saxon word "build," which means "to confirm, to strengthen, to establish, and is applicable to many other things besides building." The first volume was described on the title-page as a paper "for the drawing-room, studio, office, workshop, and cottage;" afterwards altered to "for the architect, engineer, operative, and artist;" a comprehensive profession which we think we may say has been fairly kept up during the whole course of the paper. The second number, the reception of the trial number having been encouraging, appeared on February 18, 1843, and the weekly issue has not been interrupted since. Mr. Hansom only occupied the editorial chair for a few months, and was succeeded by Mr. Bartholomew, the author of the well-known treatise on Specifications, who retired from the editorship after a little more than a year, towards the end of 1843, when he was succeeded by Mr. George Godwin, who conducted the paper for nearly forty years, until his resignation in 1883.

AT the next exhibition of the Glasgow Institute of Fine Arts, a special effort is to be made to procure a good representation of Architecture. A room has been set apart by the Council of the Institute, which, through a small one, is one of the suite, and not a *cul-de-sac*, as at the Royal Academy. This measure was taken in consequence of a special petition to the Council of the Institute, and it is interesting to note that the petition to give up to architectural drawings some of the space hitherto allotted to paintings was signed by a larger number of painters than of architects,—a fact highly creditable in every sense to the former. A circular signed by eight of the leading architects of Glasgow has been sent round to a number of members of the architectural profession in England and Scotland, drawing their attention to the new undertaking, and asking for their assistance and co-operation in securing a good exhibition of architectural drawings. We hope this will be largely complied with, and that the spirited action of the Glasgow Institute will be justified by a good collection of drawings being sent.

WITH the stir to benefit the agricultural population, and with the formation of an Agricultural Union, this journal is not concerned in a general sense. But we cannot but express a hope that the subject of the cottages of agricultural labourers will come in for some attention. It is desirable to prevent the indiscriminate migration of the rural population to the large towns, and there is nothing more likely to do this than that the village homes should be healthy and comfortable. The Legislature has of late done a great deal to make rural cottages more healthy if local authorities will carry out the law with attention and vigilance. It is impossible to take up an ordinary local newspaper without seeing instances of disease arising from insanitary conditions. These are discovered too often after they have produced sickness or ill-health, but a more careful inspection by the sanitary authorities ought to remedy these defects before they can do mischief. Again, though many landlords spend time and money in improving labourers' dwellings, there are yet all over the country a vast number of cottages in bad repair, badly constructed, and without proper accommodation. If Lord Winchilsea's union will endeavour to improve these dwellings it will make the labouring population more contented and less desirous of moving into large cities. Many proprietors of cottages, more especially small tradesmen, rack-rent their tenants and yet keep their cottages in a miserable condition, and it is this class of proprietors also, rather than the great landlords, who are most supine in regard to sanitary improvements.

IN the issue of *Nature* for December 29 some account is given of the progress of the preparations for erecting an observatory on the summit of Mont Blanc. It is stated that it has been decided to use the snow itself as a foundation, this decision being in part the result of some experiments which were made at Meudon for the purpose of ascertaining the resistance of compact snow to the pressure of a building. A miniature mountain of snow was made, pressed artificially to the same density as that which is found on Mont Blanc at the depth of one or two metres below the surface. This having been levelled at the top, discs of lead 35 centimetres in diameter, and weighing each about 30 kilogrammes* were placed on the snow, one above the other; after twelve had been piled they were removed, and the depth of the impression made was measured and proved to be only 7 or 8 millimetres (about $\frac{3}{10}$ of an inch). The information here given in the pages of our contemporary may possibly be of use to architects under some exceptional circumstances; at all events, it is of interest. We ought, however, to have been told for how long a time the snow surface was subjected to the weight before the depression was taken.

L'ARCHITECTURE for December 31 gives a description and pretty full illustrations of the new church, "Eglise du Rosaire," which it is proposed to build at Lourdes, the rendezvous of pilgrims. The design is rather a remarkable one; the church proper, which is in a somewhat Rhenish-looking Gothic, is mounted on an immense basement, and approached by two long sloping roads, carried on arches, and leading up to it from each side, the two roads or viaducts diverging from the church on plan, on somewhat the same lines as the colonnades in front of St. Peter's. The lower building, to which access is gained by a great arched portal of somewhat Byzantine character of detail, is intended, if we understand it aright, to be a place of access to the rocks whence the healing waters emerge; a kind of sacred "pump-room," in fact. The architect is M. Hardy.

IT is a very difficult matter to tell what the effect of the new railway rates will be upon different industries, as the reports at present available are rather conflicting. Last week's *Colliery Guardian*, for instance, remarks that "the new Act has been very indulgent to the coal trade as compared with other leading industries, the station-to-station rates being decidedly more favourable to the traders than those hitherto in operation." On the other hand, a Durham report of about the same date states that the new coal rates will not be well received in that district, and that they will have an adverse effect upon local traders. Similar reports come from Lancashire, but the Yorkshire coal-owners debated the question last week, and kept the result of the conference secret. This, taken with the admission of the *Colliery Guardian*, is rather suggestive of the prophetic utterance of the writer of the recent article in the *Times*, who speaks of the revision of the coal rates as involving a certain and heavy loss to the railway companies, "which will be accepted, possibly with gratitude, but certainly in silence; while each case of increase in rate will be cried from the house-tops." The effect of the change will be, of course, far from uniform, as the same traffic will be charged higher rates than before

**Builder*, July 3, 1882.

* A kilogramme is 2·205 lbs.

between some stations, and less than hitherto in other cases. Traders whose traffic mainly passes between a limited number of places will be able to estimate the difference far more readily than those who are daily despatching goods in all directions The agricultural engineers and others who have hitherto had the advantage of owners' risk rates will be hard hit if the new working classification is strictly adhered to, as no provision is yet made for owners' risk rates. It is probable, however, that details of this nature will be the subject of supplementary regulations, as the withdrawal of the old system would entail a number of claims for damage, besides seriously embarrassing the industries concerned. Traders will be enabled to ventilate their prospective grievances at the forthcoming meeting announced by the Mansion House Association on Railway and Canal Traffic, while the railway managers will anxiously watch the traffic returns for the new year. They will inevitably find decreases in certain descriptions of traffic, unless the new rates are modified, and experience will soon prove the necessity for giving way in order to avoid "killing" trade which has hitherto been a pretty constant quantity, and which they cannot afford to lose.

THE last number of the Athenian *Mittheilungen* (xvii., 3, 1892), has several important papers of general interest. Herr Julius Ziehen discusses the Asklepios reliefs, which are now at last, by the re-arrangement of the National Museum, made conveniently accessible to students. He gives woodcuts of several, which illustrate the interesting type where the god of healing himself visits the sick person. He also hazards the conjecture that the pigmy figure, usually known as Telesphoros, and regarded as the *demon* of convalesence, is really the impersonation of the Τελεσφόρα ὀνείρατα, (dreams bringing accomplishment,) which were so important a feature in ancient medical treatment. Dr. Dörpfeld has a paper on the dates, names, and topography of the various and much-disputed Odeions of Athens. He concludes that there were never more than three; the first was built by Pericles, and stood at the south-east foot of the Acropolis, near the theatre of Dionysos. It was a large covered building intended for musical competitions, but soon used for various other meetings. It was entirely destroyed in 86 B.C., and then lost its distinctive name, which passed over to a small covered theatre which Agrippa built a few years later near the old orchestra in the Agora. This is, according to Dr. Dörpfeld, the building that Pausanias called, without qualification, the Odeion. Soon after this, Herodes built the huge structure, of which we still have the ample remains. Then there were contemporaneously two Odeions at Athens; the one was called the Agrippeion, the other the Odeion of Herodes. Whether the old Odeion of Pericles, which was still standing, was used as such or for other purposes is not known. Other papers of interest are the "Muses of Praxiteles," by Dr. M. Mayer, who contends that the group called by Pliny *Thespiades* (Pliny, "Nat. Hist." xxiv., 69) were really Muses, and exercised a great influence, not only on such works as the recently-discovered Mantinea relief, but also on the minor art of Tanagra terra-cottas. Finally, there is an important paper on the "Dipylon" vases of later style, which goes far to prove that the whole disputed class are Attic work. While speaking of Athens we may note that the first volume of Dr. Kabbadias's catalogue to the National Museum has been reprinted, with corrections and additions that bring it up to date.

THE Athens correspondent of the *Standard* (December 31) states that Dr. Dörpfeld confidently asserts he has now at last found the Enneakrunos. The spot in question is in the road south of the Areopagos and south-west of the Acropolis, facing the Propylæa and leading from it to the ancient Agora. No inscription has come to light, and Dr. Dörpfeld's conviction is based on certain objects, including pipes soldered with lead, fragments of marble, and other unspecified indications which he attributes to the age of Pisistratos. Further news will naturally be looked for with eagerness. Hope as to substantial evidence of the exact *locale* of the Enneakrunos was getting a little dim. So recently as December 24 the *Berliner Philologische Wochenschrift* reported it yet unfound. It will be interesting to see how nearly the spot coincides with that conjecturally marked in by Dr. Dörpfeld in the plan of the Agora in the "Mythology and Monuments of Ancient Athens." If the Enneakrunos is really found, perhaps the most satisfactory thing of all is that we shall have no more treatises on the "Enneakrunos Episode."

THE Council of the Society of Arts are this year offering a gold medal, under the "Stock Trust," or a prize of 20*l.*, for competition among the students of schools of art in the United Kingdom, for the best original design for an architectural decoration for the interior of a building, either for the side of a room or for a hall or ceiling. The material and method of decoration are left to the choice of competitors. They are also offering, under the Mulready Trust, a similar prize for drawings from the life.*

VIENNA will this year practically close its long period of architectural enterprise of the highest order, the new Royal Palace (which will not be ready until 1900) being the only piece of monumental work still in hand, and a proposed Royal Theatre the only one in view. After the coming Spring the civil engineer will be entrusted with Vienna's public works in lieu of the architect, and if we refer to a list of the proposed works published in our columns last summer we find that he will have as much scope as the architect had during the last two decades. An enormous amount of unskilled manual labour will fortunately be required this year in Vienna, so that much of the distress prevailing in the Austrian capital ought to be alleviated. In the Austrian provinces, in Buda Pest, and throughout Hungary, there is yet much work for the Vienna architect, whose sphere also extends well into the Balkan States.

WITH the New Year two important pieces of building legislation come into force in Prussia, the one dealing with the regulation of structures in the suburbs of Berlin, the other relating to the erection of Government buildings throughout the kingdom. Both codes have been framed by Government officials after careful investigation and with the usual Prussian clearness in wording. For all that, the Suburban Act will probably have but a short life in its present form, as the local press strongly opposes the deterioration in the value of property caused by some of its requirements. The regulations for Government buildings, on the other hand, are not likely to require revision for many years, as a better drawn-up code would be difficult to find. Both pieces of legislation show careful attention to the prevention of fire-risks. The Government buildings which stand outside local jurisdiction have of late years been the scene of several serious fires. It may be added that in these public buildings the fire-risk is to be guarded against by an able fire-expert, who is an admirer of the use of the simplest preventive means, and does not let his requirements interfere with the wants of the architectural artist. This example might be followed by our Office of Works, who last month received a slight warning at Somerset House.

* Particulars can be obtained from the Secretary of the Society of Arts.

THE quarry-owners of Guernsey are threatened with powerful rivals in the vicinity of Cherbourg. According to a recent diplomatic report, the exports of macadam from the French port to England are rapidly increasing, and the material, we learn, is finding a ready sale on this side of the Channel. The export of this road metal, which in 1890 increased tenfold over 1889, trebled itself from 1890 to 1891, and as far as can be ascertained, there has been no falling off in the past year. Much, however, yet remains to be done to give this trade its legitimate impulse, although the expense and delays hitherto occasioned by cartage from the quarries was expected to be considerably lessened in 1892 by the construction of tramways and a railway to the quays. The machinery at the quarries is absurdly inadequate, and good cranes are badly wanted on the quays to facilitate shipment, though several improvements have recently been made.

THE slate industry of Angers, France, is a thriving one, and good material abounds. The quarries are situate about three or four miles from the town, and the metamorphic rocks from which they are derived extend over an area of about a dozen square miles. The greater number of the quarries are worked by a syndicate, the remainder being exploited by private individuals. Six of the workings are in the open air, the others being underground. The open-air quarry of Pont Malembert produces about two millions of slates per month, and employs 180 workmen; whilst another at La Paperie produces about the same number, but is worked with a gallery 558 ft. below the surface of the ground. Les Grands Carreaux has a gallery 164 ft. long, 148 ft. wide, and 330 ft. below the surface, producing two-and-a-half millions of slates per month, and employing some 400 people. Les Petits Carreaux, with a gallery 476 ft. underground, employs 350 workmen, and Hermitage quarry, with 400 hands produces over three millions of slates per month. La Grande Maison and La Poueze quarries yield one-and-a-half million and half-a-million slates monthly, respectively. Altogether about 3,200 workmen are employed in the slate quarries in the district, and the annual production is, in round numbers, 160 millions of slates, with a value of 145,000*l.* The slates extracted are principally of two kinds (1) ordinary, of which the price varies from 2s. 5d. to 1*l.* 8s. per 1,000; and (2) the English slate, varying from 1*l.* 12s. to 8*l.* per 1,000, according to size. The average wages of the hands employed are 2s. 6d. per diem, and many of the men are of a superior class, being very expert at their work.

THE recent fatal accident to a man in the Strand, who was killed whilst crossing that street in the dark by Lord Rosebery's brougham,—which, it is clear, was being driven slowly and carefully—again calls attention to the urgent need for passages under the most frequented streets, or bridges above them. The necessity of stopping the vehicular traffic in much-used thoroughfares to allow people to cross adds largely to the prevailing blocks, and sensible inconvenience and delay, not to say danger, is constantly caused to pedestrians. It is just as easy to construct a bridge across a street as it is across a railway. Bridges in themselves may be so made as to be no eye-sore; or the railway-bridges can be so formed and be of such materials as to be picturesque objects. Therefore there can be no reasonable objection to them on the ground that they are unpicturesque; but even if they were not beautiful, we have to put up with many things for the sake of public utility which do not add to the beauty of our cities. Holborn, the Strand, Piccadilly, and other important thoroughfares ought to be capable of being crossed by means of bridges, and there is no doubt that in time the large numbers of

pedestrians would make for the bridge crossings, and would thus relieve the crossing traffic at other places. Here is a useful and unsensational improvement for the County Council to inaugurate during the year which is now beginning.

THE *Athenæum* having removed a few months ago to new premises* in Bream's-buildings, Chancery-lane, upon the demolition of its time-honoured offices in Took's-court for the new Patent Office, wishes to know "who was Took, who survives in the court which bears his name." But it appears that the original name has been corrupted, for in Strype's "Stow" (1720), Book III., p. 282, we read:—

"And on the west side [of Castle-yard] Tuckers-or Duck-court, a large and well-built place, much inhabited by lawyers, as seated amongst the Inns of Court and Chancery; and this hath an open passage into Cursitors-alley."

Castle-yard, since Castle-street, is now Furnival-street. Strype's description is repeated, word for word, in Seymour's edition of Stow's "Survey" (1733), Book III., p. 800, and in the second volume of Maitland's work (1756) Book II., p. 965. The court is shown, unnamed, in Hollar's map of 1675, and in many others published since the Great Fire. In certain maps the name is variously given; for instance, as Duck's-court in Ogilby and Morgan's (1677), said to be engraved by Hollar; Tuke's-court in Pine and Tinney's (1749), based upon Rocque's survey of 1741–5, and engraved by Seale and Basire; Duke's-court in Sayer's reprint (1773) of Rocque; and Took's-court in Horwood's (1795–9). Seymour, on another page, calls it Duck's-alley: "Duck's-court, Cursitor-street" is cited in Baldwin's "New Complete Guide," 1774–5, and by Hatton in his "New View of London," 1708. The greater part of the court stands in St. Andrew's, Holborn; a gift of £2 per annum, in perpetuity, was made to the poor of that parish by one Thomas Tuck, whose benefaction was recorded in a table set up in the church (1673) during the rectorship of Stillingfleet, afterwards Bishop of Worcester: as Hatton tells us. A correspondent of our contemporary, last week, says that in "London and its Environs Described," 1761, he finds Bream's-buildings mentioned, and with a mark to indicate that it is named after the ground-landlord or builder. He will find it also in Seymour, and in the Parish Clerks' "New Remarks," 1732, as situated within the Rolls Liberty, St. Dunstan's-in-the-West. The rebuilding of this thoroughfare, consisting mainly of miserable tenements, was begun eleven years ago, upon the purchase of the property from the Ecclesiastical Commissioners.

A REPORT by Mr. R. D. R. Sweeting to the Local Government Board upon an outbreak of enteric fever at Temple Cloud, in the parish of Cameley, in the Clutton Rural Sanitary District, shows that though the water supply is not as flagrantly bad as in some rural districts that have been reported on, it is in anything but an ideal condition. Water is obtained mostly from shallow wells and open dipping-places, but also from open spouts (piped from springs), and in one case from a deep well in the shaft of abandoned coal-workings over 500 feet deep. These several sources of supply are, as a rule, placed inconveniently, people having to go distances varying from 50 yards to a quarter of a mile for water. The shallow wells (of which there are at Temple Cloud 17 for the 90 houses) are liable to all sorts of animal contamination, being dry-steined, and generally uncovered. We find the usual defective and insanitary conditions reported in regard to drainage and privies, which still abound in our rural districts:—

"*Drainage.*—Household slops in some cases are hand-thrown into rude catchpits situated near the external walls of cottages. From these pits refuse often leaks away into the surrounding ground, leaving in them dark, foul-smelling masses of filth. The only main drain in the place receives the house slops of a few houses and clusters of cottages at the southern end of Temple Cloud. It is constructed, for the first 50 yards of its course, of 9-in. 'sanitary' pipes, and then for 115 yards it is made up, partly of rubble and partly of 6-in. 'field pipes.' It discharges into a ditch along the roadside, which receives the contents of another ditch from the northern and central parts of Temple Cloud some 50 yards lower down. The ditch meanders for some distance before discharging into the Cam at Temple Bridge. It has been proposed by the Sanitary Authority to relay this drain entirely with sanitary pipes, and to provide a settling or subsidence tank at its termination, with discharge of the supernatant matter into a ditch. Correspondence with owners of property is still in active progress upon this subject; but nothing has been yet definitely settled.

Excrement Disposal.—This is effected by privy pits, of rude construction for the most part, often mere holes in the ground, quite uncovered or loosely covered by stone slabs, the contents of which are emptied at long intervals by the occupiers, and appied to the gardens. Usually, one small privy serves for two cottages, and is placed very close to one or other of them. But at better-class houses and outlying farms, excrement is conveyed to cess-pools well removed from houses, having an overflow to the land or to ditches; and I observed a movable pail at one cottage. At Temple Bridge, where some privies are situate directly on the banks of the Cam, the overflow from the pits finds its way to that stream; whilst at Cholwell many privies are situate directly over a stream tributary to the Cam. I saw at my visit masses of excrement on the surface of this stream, which passes close alongside and in front of cottages hereabouts."

THE recent decision in the Circuit Court of New Jersey, under the New American Copyright Act, in favour of Messrs. Eyre & Spottiswoode, shows that under the Act English publishers will be able to bring piratical American publishers to book when the Act applies. Messrs. Eyre & Spottiswoode registered the copyright of a mezzotint engraving under this Act; it was a reproduction of Mr. Sant's painting which he called "Little Lord Fauntleroy." The New York *Recorder* Company pirated this engraving under the title of "A Noble Friend," in the form of an art supplement to the *Recorder* paper of February 28, 1892. It is worthy of notice that the fraudulent character of this performance was clearly understood by the American publishing company, as they reproduced the engraving under a different title. But whilst this decision shows that when this Act applies the law will be enforced, it is clear that it can only be done with a good deal of trouble and expense. Moreover, it cannot restrain American publishers from the practice of making use of illustrations which are published in journals in this country, such, for instance, as appear in the pages of the *Builder*, which are frequently reproduced in America without permission and without payment.

THE LOAN EXHIBITION AT BURLINGTON HOUSE.

ALTHOUGH we cannot echo the opinion which we see expressed in some of the daily papers that this year's Loan Exhibition is equal to any of its predecessors (a statement which is, in fact, regularly repeated every year, some critics having, apparently, imperfect memories), it is certainly a finer one than those of the last year or two, and includes some works of exceptional interest and power. Among these may be mentioned the two remarkable Rembrandts, the portrait of the painter's son (50), one of those half-lighted heads in which Rembrandt delighted, and in which the mere mechanism of portrait-painting seems entirely concealed; and the half-length "A Man in Armour" (111); which, in some respects, one would hardly take for Rembrandt; in the rich and ornate treatment of the armour and the style and cast of the features the painting reminds one of some of Lionardo da Vinci's heads of armed men. The portrait of his son, on the other hand, is one of the most thoroughly Rembrandtish pictures that one could well see. Among the larger works of the year Vandyck is represented by the noble portrait group lent by the Earl of Strafford, of Thomas Wentworth, earl of Cleveland, and his wife, son, and daughter. The two men are standing, the father on the left hand, the son in the centre of the picture, the lady seated on the right, with her daughter standing behind her. The young man, with his light hair and handsome face, clad in complete armour, makes a charming centre to the group, and the figure of the Earl is full of dignity; the female figures are less attractive, and have a somewhat *bourgeoise* look very unusual in a Vandyck group. At the opposite end of the long gallery hangs Rubens's brilliant, powerful, and bustling picture of the "Daughter of Herodias" (128), a festal scene among the Flemish aristocracy, with a Scriptural title appended to it. The same painter's "Holy Family" (74), in Gallery II., has more the appearance of having been intended as a religious picture, and is both finely composed and fine in colour; yet it does not impress one as a work of the highest class, perhaps because the trick of composition is too obvious, and gives the picture we know not what of an academical appearance. On the north wall of the large gallery hangs the Earl of Strafford's "Holy Family," by Titian (117), one of the painter's open-air representations of this time-honoured subject; it is very cracked and gone in parts, and probably generally faded more or less in tone; but the flesh of the Virgin and the child, so much of it as is seen, has a remarkable richness and warmth of tone; it seems really to radiate a mild, warm glow from the canvas. The same painter's "Diana and Actæon" (120) is either much damaged and repainted, or is a poor and mediocre specimen of Titian. On the same wall hangs Giorgione's strange painting of "The Adulteress brought before Christ" (119), in which there is a kind of attempt to give a dramatic expression of the situation by means of figures wholly of the costume and style of the painter's own day; the man in armour on the left, with his back to the spectator, is a peculiarly Giorgionesque figure. On the opposite (south) wall of the long gallery the centre place is filled by Turner's "Festival upon the opening of the Vintage of Macon" (137), one of the largest but not one of the finest of Turner's pictures, at any rate not in its present condition. These are the large works of the year, to which we may add also Landseer's painting (37) of the man who has been let down into a crevice after a stag and two dogs which have fallen over the precipice, of which one dog is still living, and is caressed by the man as he shouts to his comrades; that is to say, he is said in the catalogue to be shouting, but he is not really, he is only going through a pantomime which does not strain his facial muscles the least; nor are the rocks real rocks, they are only property rocks; but the painting and drawing of the dead stag, foreshortened, are splendid.

Among other things in Gallery I is Lewis's splendid and sumptuous painting, "The Doubtful Coin" (38), with the woman's yellow dress making a kind of brilliant flash in the room, and with the bit of architecture shining in strong sunlight at the back of the composition. His picture of the "Bezestein Bazaar, Cairo" (45) is also here. Both make one regret rather that such splendid powers should not have been expended on subjects which possess some dramatic, as well as picturesque, incident. The brilliancy with which Lewis puts on canvas this gorgeous effect of Oriental colour in dresses, jewels, silks, and strong sunlight through occasional apertures, is wonderful; but his whole mental energy goes to producing the effect, there is no interest in the scene or the people, other than that picturesque interest which the scene itself would have; there is nothing behind that; they are pictures addressed to the senses rather than to our reason or our feelings. There is more of human interest in John Phillip's "Chat round the Brasero" (36), for the figures have considerable individuality of character, and are not merely figures to produce an *ensemble;* in every sense this is a very good specimen of Phillip's somewhat restricted powers.

Among the portraits in the collection one is glad to see three examples of that fine and too much forgotten English painter, Sir William Boxall, of which the finest is the portrait of the late Frederick Huth (42), a most dignified and refined work in pose, feeling, and execution. Other noticeable portraits in the first room (devoted as usual to deceased English architects) are Romney's "Mrs. Dawson" (7), and Reynolds's "Lady Elizabeth Keppel" (21), which latter has indeed suffered much from time, but is a work marked by strong individuality of style and (as far as it remains) colour. Gallery II. contains a powerful Rembrandt portrait of an old lady (75), and in Gallery III. Murillo's full-length portrait (107) of a man of common-place appearance but in a very picturesque dress, is notable as a piece of strong,

* For an illustrated description, see the *Builder* of April 9 last.

solid, brilliant workmanship. At the opposite end of the room are some fine Vandyck portraits, and in the same gallery is a lovely portrait of "Miss Close" by Romney (100), a young lady of great beauty in the white dress which Romney seems to have had such a preference for, seated in an attitude in which dignity is combined with natural grace and ease.

Landscape is not very strongly represented; in the first room is a work by Constable which he can hardly have considered as more than a study for a landscape, but which forms an instructive contrast with J. B. Pyne's pretty but over-finished and artificial view of Eton College (33), a picture which attracts at the first glance by its exquisite art, but in which art is so over-refined that we lose sight of nature. Callcott's large seapiece, "The Mouth of the Tyne" (12), with a delightful old round-bowed ship with bulky timber catheads coming up with the breeze, is a curious survival of a manner of painting the sea which was considered, we presume, to be satisfactory in Callcott's day; long shallow troughs of waves, each of the same curve and each with the same little break and cresting at the apex. Did sea-painters ever look at the sea then? One would almost think not. We have made advances in this respect at any rate; painters who profess to paint sea nowadays at all events look at it and try to see how it really does move, and what colour it is under different atmospheric and other conditions. It is noticeable, too, in this picture, although it is evidently intended to be a bright breezy day, what a dull brown hue there is over it all, as if the painter was afraid of sunlight, and wished to tone down the brilliancy of nature to a decorous Academy standard. One of the finest landscapes in the rooms, in regard to force and poetic effect, is Rembrandt's small picture "Tobias and the Angel" (89), a dark scene of piled up rocks which seems almost threatening in expression. The three or four small and delicate landscapes of Van der Neer are an attraction of the exhibition, especially the landscape "Early Morning" (94), with the distant ship scene against the eastern sky.

The Dutch Room (Gallery II.), besides the works we have already alluded to, contains the usual average of works by Teniers, Metsu, and Ostade, in which we seem to meet each year the same figures engaged in nearly the same indifferent and uninteresting occupations, and painted with the same care and attention to details. Mrs. Baillie Hamilton's Teniers, with an old man wheeling a barrow of most religiously studied cabbages (49) is one of the best and one of the most typical. Far be it from us to deny that each one of these pictures is a possession in itself, for certain qualities; but the contemplation of a number of them together leaves a sense of monotony and of a very low intellectual standard of painting. It must be admitted that there are no works of this school, in this year's exhibition, so pre-eminently brilliant after their kind as some that have been seen in former years. Nor are the majority of the early Italian pictures in Gallery IV. of very much interest except from the historical point of view. The finest thing in this room, and one of the finest portraits in the collection, is that of Sir Thomas Gresham (177) by Antonio More, which, with two or three others of similar type, has been placed in the gallery otherwise devoted to early Italian work.

The special feature of the exhibition is the collection of drawings and water-colours by Calvert, Palmer, and Blake, all friends, and all with somewhat similar tendencies to the mystical. Calvert is just being resuscitated, perhaps partly owing to the attention which some specimens of his work recently exhibited in the British Museum Print-room have excited. He is well worth resuscitating. With some of Blake's mysticism and imaginative faculty, he drew much better than Blake usually took the trouble to draw; for from some of his work it is obvious that Blake *could* draw the figure much better, when he chose, than he generally did choose. He seems to have been so much occupied with the idea to be expressed that he neglected the drawing. The collection of his large coarsely executed sketches for illustrations to Dante, in the small room beyond the water-colour room, will we fear send many devout Blakists away feeling a painful doubt about their idol. It is possible that had Blake engraved these on a small scale, in his peculiar fashion, he might have made them as interesting and powerful a series as the illustrations to the book of Job; but as they stand they are certainly very fearful productions.

The works by Calvert which are exhibited are partly a series of very interesting studies in oil, in very low tones and in a kind of half-light effect, of ideal subjects illustrated by nude figures; the scenes being given in a faint light making them look like dreams of pictures. But superior to these, and perfectly exquisite in their way, are Calvert's small engravings, apparently for book illustrations, of which a few are framed together (105, 106, 117). There is a certain naïveté about these, as in Blake's similar works, but they are much better engraved than Blake's; and the poetic feeling and fancy of these little works, and the manner in which luminous effect is got in sky and water by the powerful treatment of the shadowed portions of the landscape, can hardly be over-estimated. The little figures introduced, too, are full of poetic charm. Besides these, there is to be seen again in this room Palmer's series of grandly conceived if somewhat exaggerated landscapes, partly in illustration of Milton's *l'Allegro* and *Il Penseroso*, and which have something Miltonic in their stateliness of composition and their bold masses of colour. These have been exhibited in London not long ago, and we have commented on them recently; every one will be glad to see them again; they do indeed suggest questions as to the relation of landscape-painting to actual nature, and they are exaggerated in effect in some cases and do not present a perfect balance of execution; but at least they carry the mind higher than the boozing boors of Ostade and his brethren.

The large collection of water-colour sketches by a former Marchioness of Waterford, in the same room, we cannot find space to speak of particularly, but they are well worth attention and show the true feeling and power of an artist; and in some senses the water-colour gallery may perhaps be considered the most interesting room in the Loan Exhibition of 1893.

LETTER FROM PARIS.

WITH the approach of the New Year the minor exhibitions began to open in various galleries.

At the "Théâtre d'Application," in the Rue St. Lazare, there have been for some days exhibited a collection of the landscapes of M. Havet, flower paintings of very decorative type by M. Schuller, animal paintings by M. J. J. Rousseau, and portraits by M. Dagnaux, one of the best pupils of M. Roll. At the George Petit Gallery there is an interesting collection of faïence by M. Lachenal, an artist who has worked energetically to revive that ancient art in France. This year his exhibition, which consists of works in stoneware and in enamel, shows some interesting novelties of effect. There are a good many decorative pieces treated with animal subjects, very well modelled. We may mention also, at the gallery in the Rue de Sèze, the watercolours of MM. Ogier and Jacquin, interesting recollections of a tour in Biscaye.

We also find at the George Petit Gallery the best of the painters who every year unite their works under the title of "Exposition Internationale." Among these artists, the majority of whom are landscape painters, M. Cazin holds the most important place, several of his works reminding one very much, in their quiet harmony of colour and a certain calm that pervades them, of some of the best of the Dutch school of landscape painters. M. René Billotte, who loves half-lights and evening effects, paints scenes in the Parisian suburbs and in the dunes of Gascony; M. Dumoulin paints St. Petersburg and Paris; while M. Dauphin forms a contrast with his warmly-coloured scenes from the South of France, among which especially is a remarkable study of Cap Martin, Monte Carlo. The landscapes of M. Montenard and M. Gagliardini, the views in England by Mr. Walter Gay, the portraits by M. Jacques Blanche and the pastels of M. Prins, are also worth attention.

The next Champ de Mars Salon will probably include an important ceiling painting by M. Puvis de Chavannes, the first work he has painted for a ceiling. It is intended for the grand staircase of the Hôtel de Ville, and the sketch has been accepted. The design is perhaps not sufficiently "plafonnante" in style, but it was felt to be undesirable to try to impose on so eminent a painter any conditions contrary to those to which his own taste and habits in painting would naturally lead him; and if the work is rather a "picture" than a ceiling painting, it will at any rate be in harmony in other respects with architectural conditions, and will not appear, like some decorative paintings, to dig a hole in the surface on which it is painted. The subject is "La Ville de Paris, couronnée par les Lettres, les Sciences, et les Arts, agrée l'hommage du Chantre immortel qui l'a célébrée." Victor Hugo, clothed in a long floating garment, and crowned with laurels, presents his lyre to Paris. A trio of flying figures symbolise lyrical, legendary, and dramatic poetry. Under a portico, which seems rather wanting in substance, a group of youths, attendants on Paris, wave palms. Fifteen compartments, in the form of tympana and arches, are treated in relation to this central work, the tympana being occupied with figures representing "l'Esprit," "l'Elégance," "l'Urbanité," &c. On the arches are other allegorical figures, including "Paris au moyen age" and "Paris moderne."

The question of the Expiatory Chapel in memory of the death of Louis XVI. and Marie Antoinette is again coming up, and this time the Municipal Council has abandoned its claim for the destruction of the Chapel, which is not, in fact, under its control, having been built on ground belonging to the State. It has confined itself to demanding the erection, on the neighbouring square, of a monument to Lepeletier and Saint Fargueau, who, having voted for the death of the king, were afterwards stabbed by a garde-du-corps named Pâris. This is to be a simple bust with some symbolical ornaments, and M. Dalou is to be asked to execute the bust. It is hoped that this proposal will satisfy all parties and put an end to the long wrangle about the Chapel in the Boulevard Haussmann. The Government, however, does not look with much favour on the idea.

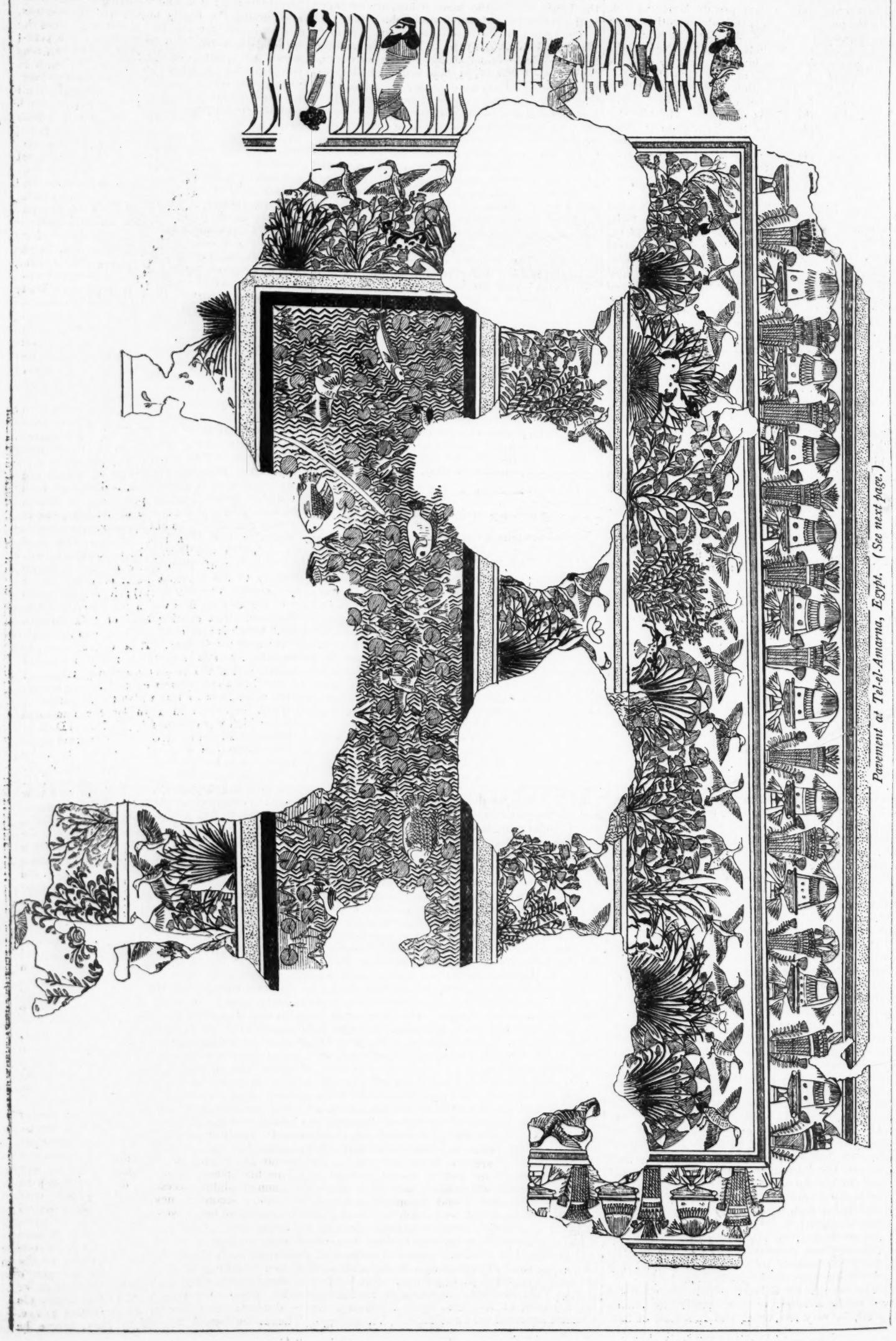
The Department of National Museums has received some interesting donations: Assyrian bas-reliefs, bronzes from Cyprus, early vases from Crete, &c. We may mention also, among modern works presented to the Louvre, the original plaster model of the monument to Watteau at Valenciennes. This monument, placed in the centre of a fountain, the vases of which are ornamented with bronze swans, is decorated with the figures of the leading personages in Italian comedy. Above is the statue of Watteau, one of the most graceful works of Cayreaux.

There is talk of a new coinage, with new effigies, which will shortly be seriously studied. The Republic of 1870 made no new coinage (contrary to the previous habit of doing so at every change of government); it merely made use of the existing dies which were in the State collections. The existing head of "La République," which is very commonplace, was the work of the sculptor Oudiné. It is desired now to substitute for this something really new and original, and if the project is seriously taken up, there will be a competition opened among artists, on the same lines as that which the Municipality of Paris organised in 1879 for the municipal medal, which was designed by M. Daniel Dupuis.

There have been disagreeable occurrences again at the École des Beaux-Arts, similar to those which a few years ago led to the closing of M. Bonnat's atelier. This time it is the pupils of M. Gustave Moreau's atelier, who inflicted on a new comer the cruel and stupid persecutions known as "Brimades." The affair was brought to a climax by a resolution that the new student should be painted Prussian blue. The Minister of Fine Arts has intervened for the establishment of better order in the studios, and the authorities of the École are to keep a strict watch from this time and take severe measures in case of any outrages of this kind being repeated. One moral from the story is that the behaviour of our young artist students affords a proof that any idea of opening the schools to young women, so much talked of a little while ago, is entirely out of the question for a long time to come.

While referring to the "École des Beaux-Arts," we may mention that the jury commissioned to judge the competition for "Enseignement simultané des trois Arts" has awarded second medals to MM. Dauné and Bliant, pupils of the second class in architecture, and medals to MM. Dufour and Guadet. M. Mayeux has obtained a medal for the competition in decorative composition, the subject being "Un foyer de Théâtre Lyrique."

The unexpected death of the painter Victor Galland has caused much regret in the artistic world. Galland, who had achieved an important position by dint of energy and hard work, was the son of a goldsmith at Geneva, where he was born in 1822. He came to Paris at the age of seventeen, and having worked for two years under the architect Labrouste, he entered the atelier of the painter Drolling, dividing his studies between painting and architecture, and doing various decorative work to gain a living. Thus, he collaborated with Ciceri in the decoration of the Palace Theatre at St. Cloud. In 1858 he began to distinguish himself in work for the decorations for public fêtes. He then went to Constantinople to decorate the palace of an Armenian prince. Thence he betook himself to Italy, where he



Pavement at Tel-el-Amarna, Egypt. *(See next page.)*

studied the pictures of the old masters for several years. On his return to France he was commissioned to decorate several private houses as well as some public buildings, and subsequently carried out important works of this kind at Stuttgart, London, Madrid, St. Petersburg, and New York. As a good example of his style we may mention the figures of angels in the Church of St. Eustache, the "Prédication de St. Denis," in the Pantheon, and a number of designs for tapestry intended for the Palais d'Elysée. He also designed the diploma for the Exhibition of 1889, which was the subject of a public competition. For the last twenty years Galland had been professor of decorative art at the École des Beaux-Arts, and was also director of works of art at the Gobelins.

Galland's last important work was the decoration of the grand gallery of the Hôtel de Ville, parallel with the three *salons à arcades*, representing the Parisian trades and corporations in the sixteenth century. It has been much criticised, perhaps with reason in some respects; but it must be admitted that it is at all events a very learned work, to which much study must have gone. One praise that must be given to Galland is in regard to his absolute respect for the architectural lines in decorating a building, the result, no doubt, of his early architectural studies. He was most difficult to satisfy with his own work, keeping it on hand and touching and retouching it, often expending on this perfecting process more time and labour than the price he received for his work could at all compensate him for. Naturally, with this self-abnegation in the interests of his art, he died poor. He leaves a wife and three children—two sons who continue worthily the artistic traditions of the family, and a daughter who married M. Jean Gounod the painter, son of the celebrated composer.

M. Georges Brétegnier, whose decease, as well as that of Galland, has already been mentioned in our columns, was a pupil of Gerôme and Meissonier, and exhibited for the first time in the Salon of 1881, a portrait; and in the Salon of 1887 had a large historical picture, "Henry II. at the tomb of Thomas à Becket." In 1889 he became one of the original members of the Champ de Mars Salon, where he exhibited "L'Atelier de Meissonier." He had two important pictures in the last Salon. His death, at the age of thirty, cuts short a career full of promise.

We have also to record the deaths of the sculptor Alfred Gauvin, an able artist, and of the landscape-painter Dallige de Fontenay, a pupil of Hersent and Watelet, who has died at Paris at the age of eighty.

PAVEMENT AT TEL-EL-AMARNA, EGYPT.

BY the courtesy of Dr. Flinders Petrie, we are now enabled to reproduce his own drawing, which shows the design of the remarkable pavement found by him during the recent excavations at Tel-el-Amarna.*

The pavement is that of one of the largest of the halls, that of the Harem, of the Palace of Amenhotep IV., the founder of the city, the site of which has now been excavated. One half of the pattern only is shown, the dimensions of the hall being 60 ft. long by 20 ft. wide. Another apartment adjoining has a pavement of similar construction. Dr. Petrie concludes from the difference of the patterns that the two sides were executed by different artists. They are certainly of different years, and there are signs of reconstruction. "The weaker artist did the first groups; he endeavoured to balance his inferiority by attempting more than his rival; he introduced convolvulus and insects in the first group, dragon-fly, locust, and butterflies; in the second group he attempted foreshortening the heads of the calves, the first such trial that we know of. The superior artist is the earliest free and naturalistic painter that we know of; the first man to draw from memory animals in rapid action, and to seize the waving and graceful spread of plants; and the first man who cast aside mere symmetry for artistic balance. We know of no rival to the ability shown in this sudden birth of art until the animal figures of later Assyria and Greece, and the plants painted in modern ages. The young bull bounding in the air is a most vigorous sketch, admirably conceived, but only failing in the details which the memory could not easily grasp in rapid motion." Elsewhere, Dr. Petrie has pointed out reason for the belief that these paintings were the work of native artists, and not foreigners, for while several of the objects are drawn with great freedom of design and execution, yet the groups of the lotus, done by the same hands, are arranged in the conventional mannerism of older times.

The breaks in the design, where the pavement is wanting, show where the bases of the columns formerly stood. Some shattered fragments of the columns were discovered, from which a restoration was possible. They have already been described. The walls were also decorated in colour, and the broken remains were abundant enough to show that the large hall must have been a blaze of harmonious decoration.

The borders of the pavement are broad bands of black and yellow, the latter colour under the plants being to represent yellow sand. The scrap of water and birds has formed part of an earlier pavement,—perhaps ten or twenty years earlier,—which was broken up when worn, and a new one laid down and painted, the earlier one being of a different style, of smaller pattern, with a grey outline. The colours of the pavement are natural, the bulls being reddish-brown or white, the thistles purple blue, and the foliage of various tints of green.

The floor is of brickwork, formed of sun-dried bricks of Nile mud, the ground surface having been previously levelled, and laid flat in a single course. Over them was spread a layer of hard mortar, which, filling up inequalities, averages from ½ in. to 1 in. in thickness. Above this was a finishing coat of fine plaster ⅛ in. in thickness, with a good deal of hair. The main lines were marked out when this coat was soft, by stretching strings which were pressed into the plaster. In some cases, portions of the colouring were done when the plaster was still wet, for marks of the brush can be detected. The surface was afterwards completely water-proofed and polished, so as to enable it to bear walking upon.

The patterns, excellent for wall decoration, are hardly such as would be chosen by a modern designer for a flooring surface; nor are they quite what we should expect to find on an ancient pavement. Yet, here they are, revealed to us after being buried for so many ages, with all their curious details of construction. We have already spoken of the remote antiquity of these remains, and of the certainty of the correctness of the date assigned to them. In examining all the relics from this site, we may remember with advantage that they reveal to us the state of the arts at a period of 3,000 years ago,—a date anterior to the Exodus, according to some of the best Egyptologists; nearly 500 years before the building of Solomon's Temple; and more than 900 years before the age of Pheidias.

The interest attaching to the discovery of this remarkable work has caused the Egyptian Government to have it roofed over, and as a further protection, it has a guard of custodians.

* See last volume of the *Builder*, *p.* 253.

RAILWAY VIEWS OF BUILDINGS.

WE are not ashamed to confess that when in a train we like to look out of the window. We know not why it is, but we nearly always find our travelling companions ashamed of being caught in this act, and they always pretend to be deeply absorbed in the perusal of some newspaper or magazine. As, however, they seem only too ready to lend this periodical to some one else and appear disappointed if it is declined, we believe that at heart they are quite as fond of looking out of window as we are, and that their literary enthusiasm is little better than a sham. The wide-awake advertiser has found them out and knows their weaknesses: he is not to be deterred by any such pretences; hence we find his soaps, pickles, mustard, and ballet girls, represented in gorgeous colours on every coign of vantage that is visible from the rail.

Now, why should not the architect and builder be as wide-awake as the advertiser? That they are not so is evident, because we notice that new buildings invariably turn their backs to the railways, and very ugly backs they generally are. It is by no means an uncommon thing to find a church, chapel, or public building, which has a most elaborate front covered with carving and decoration facing some little back street down which not a hundred people pass in the course of the twenty-four hours, turning towards the railway a blank brick wall round which not even cornices or string-courses are continued, though thousands of people see the building alone from this point of view.

The sketch (Fig. 1, next page) represents the kind of view which one gets of many modern buildings from the railway.

We are not here complaining of private houses backing towards the rail; there is generally something interesting to be seen about the backs of private houses; it is like "looking in unawares," and finding the family unprepared for visitors. (Fig. 2.) We are able to see that one "does the washing at home," that another keeps fowls and does not care about gardening; whereas the next has a trim, pretty garden, with a nice grass plat. Another is completely overrun with children—broken toys, mud castles, and puddles, occupying the whole space, and it's many a long day since the gardener had a look in. The next, perhaps, has a flagstaff on the lawn, and a summer-house made of old ship's timbers. Another has a vast bottle-rack, but—one must not judge too hastily.

Now all these have a character about them, and offer suggestions to the mind, and, consequently, they are a relief to the weariness of a long journey. Whereas the blank walls which form the backs of churches and public buildings, not only offend the sight, but are apt to make one jump at the conclusion that modern architecture is a sham, entirely calculated for show!

It is a very singular thing that when a railway runs through an old town the view obtained is almost invariably picturesque, although, of course, it is merely an accident that it is so. Canterbury, Ely, and Rochester are cases in point; but, where the line passes the portion of a town built *since* the coming of a railway the effect is almost invariably unpicturesque, if not hideous: Cambridge, Derby, and Bristol, for instance.

The tricks which railways have played with old towns are very peculiar, and many of these places have suffered in appearance in consequence. Those, for instance, who remember visiting Oxford by coach, and the magnificent effect of the city, driving over Magdalen Bridge and up the High, cannot help contrasting it with the present approach through St. Thomas's. An old Oxford man, a distinguished member of the University, once declared to the writer that he believed that an important portion of a man's University career had been sacrificed by this change, for it was never possible now for a man coming up to Oxford for the first time to receive the extraordinary impression which used to be made by the old approach. At Leigh, near Southend, the railway has done exactly the reverse, as it has appropriated the high street of the town, so that the place presents its best aspect to the railway.

We believe people often take it for granted that there is far less to be seen from a railway than is actually the case. Many people will tell you that "you see nothing of a country when passing through it by rail;" that a railway journey is so uninteresting that they prefer travelling by night and sleeping through it. Now this is a great mistake; and the whole of our experience proves exactly the reverse to be the case. Some of the most interesting places that we have ever visited attracted our attention from the view they presented from the railway. Würzburg in Bavaria, Schwäbisch-Gmund in Würtemburg, Bamberg and Maestricht (Fig. 3), Ingolstadt, and many other most interesting towns in Germany and Holland, we should never have seen had we not first spied them out from the train. Würzburg is a remarkable example of this. We only intended to stop there for refreshments and then go on to Nuremburg, but the view of the place, and of several little towns which we had passed in the neighbourhood, determined the writer to stop there and thoroughly explore the neighbourhood, with the result that for ten successive years he made it his headquarters for sketching expeditions, part of the results of which appeared in the form of illustrations and articles upon ancient German architecture in the *Builder*. Unfortunately, since we first visited it, the approach to Würzburg by rail has been slightly changed, and the station shifted to another end of the town, and although the view is still fine, it is less striking than our first glimpse of the town, of which a sketch is given (see Fig. 4, page 11).

In conclusion, we beg to offer the following advice to all architectural and art students who are bound on sketching expeditions. In the first place, *never travel by night*, except when absolutely necessary, or on a return journey home. Secondly, never make a hard-and-fast programme before you start, but leave your route undecided. Thirdly, never hesitate to sacrifice your railway-ticket, or portion of it, if you see anything that attracts you by the way; the few extra shillings which you lose weigh so little in the balance when compared with the advantage of exploring some interesting old town and sketching some original and characteristic work. And fourthly, do not worry yourself about getting any particular distance—if good material falls in

Fig. 1

Fig. 2.

your way nearer home, why go farther afield? Places that are the farthest away do not always offer the most valuable material, or even the greatest contrasts to what you are accustomed to see. There are many little Dutch towns, which are passed in a hurry to get to the Rhine or Switzerland, that are quite as interesting in their way as anything that will be discovered on the "grand tour." As Talleyrand said, "It is the *unexpected* which always happens." And this is as much the case in a sketching tour as in anything else. There is more pleasure, and often more profit, in the discoveries you make in a place which you did not know of before seeing it, than in the inspection of some place which you have carefully read up beforehand.

So we say to students, always look out of window when you are travelling by rail, and when you become a practising architect, remember that others may often see your building from a "railway view." H. W. B.

Illustrations.

SOME ENGLISH ARCHITECTURE OF THE LAST FIFTY YEARS.

THE large plate which forms the first of our illustrations this week is, as will be seen, a panoramic grouping, by Mr. H. W. Brewer, of some of the principal buildings erected in England during the last half-century. We give also a key to the plate. A general review of the progress of architecture in this country during the last fifty years forms the subject of our first article this week.

YORK MINSTER.*

THE view of York Minster, which forms No. 26 of the illustrations of the Cathedrals of England and Wales, is, as in some previous cases, taken from a supposed position which, owing to intervening houses, is not really accessible. The view shown here can really be seen from the road which runs round the north-east of the cathedral (except the upper part of the western towers and of the north transept gable), but no picture could be made from this point of view, as the angle included would be too large to take in the building in a drawing. The reason for selecting this view is that it presents one of the most picturesque aspects of the building, and one which is less known, drawn, and photographed than most others, and also because we must confess that we have never been able greatly to admire the west and south façades of the building. The west front, in spite of its exuberance of detail, is somewhat coarse and commonplace in design, and the same may be said of the south transept, and therefore we have preferred to take the north side in spite of the disadvantage of having to take the shadowed side of the building. There are other fine points on the north side; the bold and massive treatment of the nave, for instance, and of course the celebrated "Five Sister" windows, but the latter have been so much illustrated that it was of less importance to include them here. On the other hand, we get in the foreground the Chapter-House, which is one of the most characteristic and picturesque features of the building. In fact, York, like Canterbury, is so large and multifarious a building that one can no more give a single general view of it from any close quarters, than one can give a general view of a town.

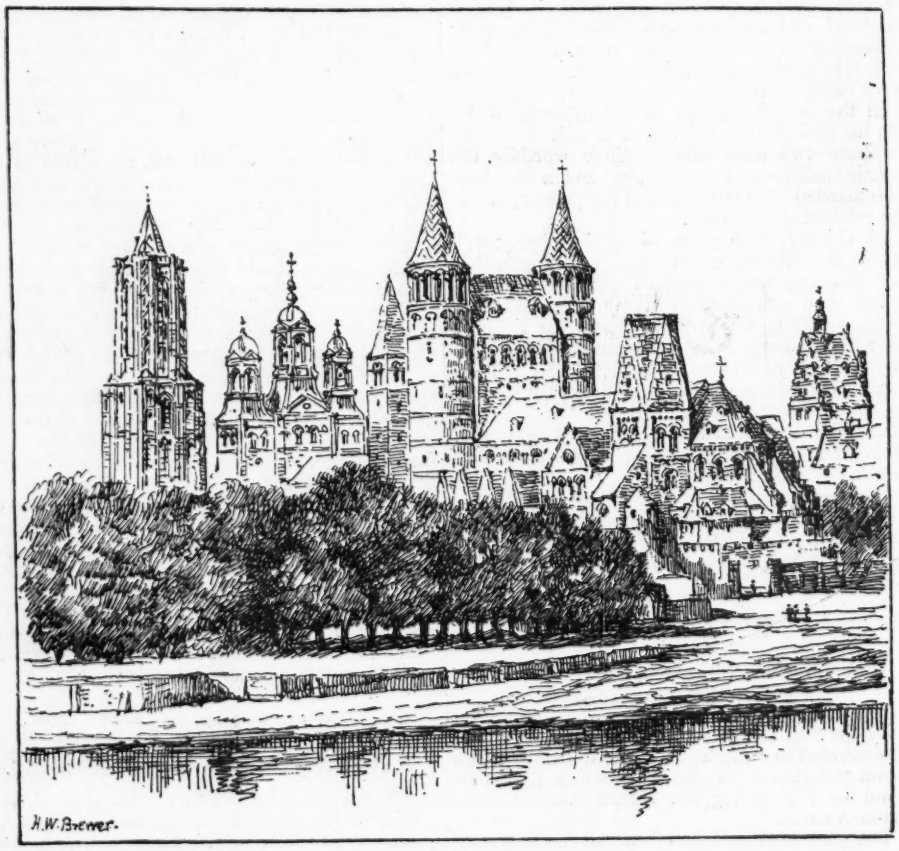


Fig. 3.

York was the site of a church from as early as 627 A.D., when a small chapel or oratory is related to have been built at the baptism in that year of King Edwin, who subsequently commenced a permanent stone church on the site, and one or two other churches succeeded each other and fell to decay; in fact, York Cathedral seems to have been specially marked out as the prey of fire, down to the comparatively recent conflagration in the present century.

The present cathedral in the main may be said to have had its rise after the fire in 1137, when Bishop Roger commenced the rebuilding of the choir in 1171. In 1260 the north transept of the church was built by John le Romayne, the treasurer of the church, and was completed in 1260. He also erected a central tower. His son, the archbishop of the same name, laid the foundations of the nave in 1291, and this and the two western towers were finished in about forty years from that time, by Archbishop Romayne and his suecessor, William de Melton. Archbishop Roger's choir, howe ver, was destined to disappear, owing to the usual Mediæval feeling of a desire to improve on the narchitecture of a former period, and to rebuild it io the style of the day; and accordingly Archbish ıp Thoresby in 1352, deliberately pulled down ha f of Archbishop Roger's choir, and built the eastern extension of presbytery and Lady Chapel. The western portion of the old choir very soon followed, at a slightly later date. There appears to be no record that the former choir was dilapidated, or that it was destroyed for any other reason than the desire to put something better in its place. Shortly after this the present tower was erected, and with the exception of the Chapter-House, the cathedral may then be said to have assumed in the main its present architectural aspect, the other additions and alterations having been of minor importance.

In the process of measuring for the plan of the cathedral given in the present number, some irregularities have been detected in the laying out which afford interesting evidence of the difficulties experienced in fitting some of the portions together, in the process of altering and rebuilding piece by piece.

At first sight few of our Cathedral plans look more simple and regular than that of the Minster at York. There are, however, several points throwing light on the

* This series of illustrations of the Cathedrals of England and Wales was begun in our issue of January 3, 1891. A list of those already illustrated, with particulars of fut re arrangements, will be found on page 22.

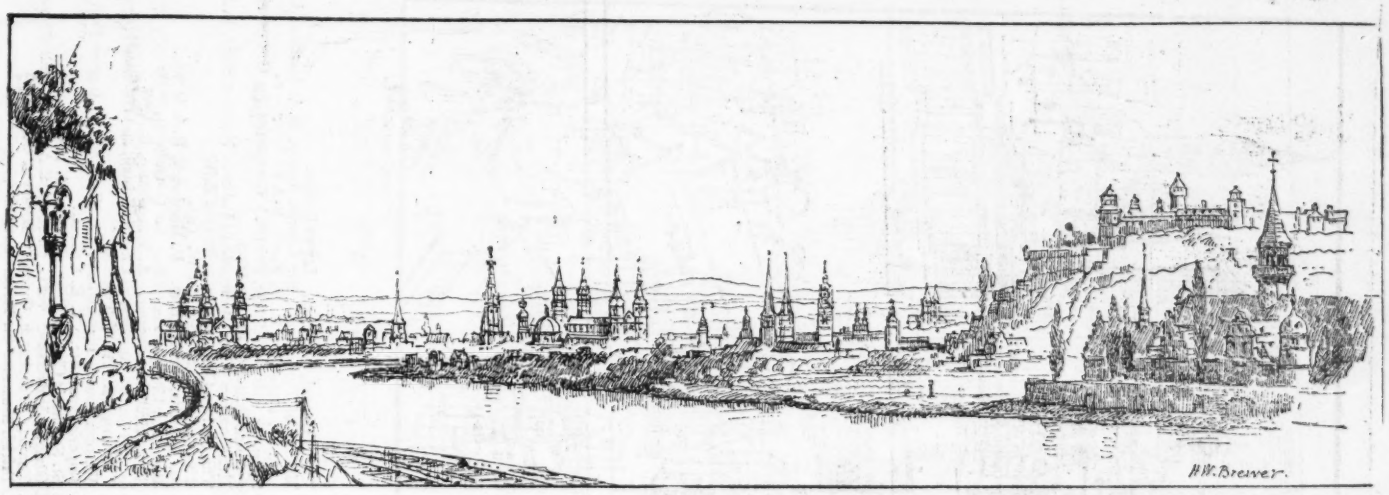
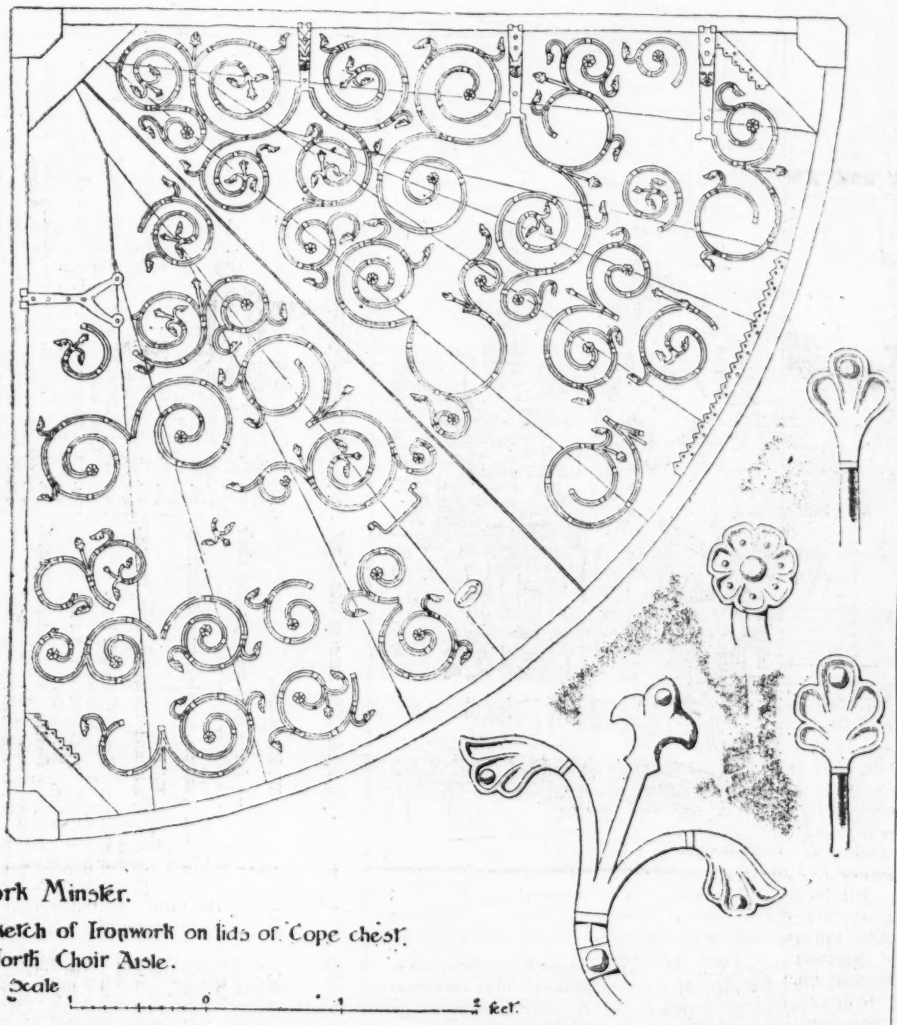


Fig. 4.



history of the building some of which are shown clearly on the plan given in the present number, others smaller in scale, which would probably be passed over if attention were not drawn to them, and which have been noted during the process of measuring and plotting.

The tower piers still retain their Norman core, which is the only Norman work above the floor level. The other important fragment of the early church is the crypt under the choir. The tower piers have been added to at various times. The western sides of the western piers are Decorated, forming the responds of the nave arcade. The north and south sides of the north-west and south-west piers respectively are likewise Decorated—part of the reconstruction in Decorated times. The western arch does not stand at right angles with the north and south arches of the tower, as the width of the easternmost bay of the nave arcade is wider on the north than on the south by a foot.

The axis of the Chapter-House is not parallel with that of any other portion of the building—not even with that of its vestibule. The Chapter-House was, as is shown by its mouldings continuing on the exterior, built before the vestibule; and the latter, when erected, being made parallel with the north transept out of which it leads, was joined on to the Chapter-House proper without regard to its being parallel with it. The whole of the eastern arm of the church—the choir, presbytery, and Lady Chapel—presents some curious instances of irregularity. When Thoresby's Lady Chapel and presbytery (the four eastern bays of the present church) were built, the early English choir was standing, causing some difficulty, no doubt, in the setting-out of the new work. The centre of the east front was, however, made to agree with the centre line of the nave and central tower. But beyond this the lines of the new work do not seem to have been laid down with very accurate measurement. In the first place, the main axis of the centre of the presbytery bends to the north (going westward), and at the eastern face of the lantern is, as near as possible, 2 ft. 6 in. north of the centre line of the lantern and nave. In addition to this, the sides of the presbytery (the four east bays of the eastern arm) erected by Thoresby are not parallel, but are closer together at the bay west of the present reredos than at the east end. This is still more marked in the side aisles, the result being that the east walls of the aisles are not parallel with the east wall of the centre alley, and the buttresses at their angles are turned outwards. The western portion of the presbytery (including the choir proper) built by Thoresby's successors, has its walls practically parallel, but the main axis or centre line of Thoresby's work was kept, causing the divergence before noted at the central tower. This in its turn has affected the later rood-screen, its doorway having had to be made central with the choir and not with the tower. There are consequently eight divisions containing canopied arches and statues on the south side, and only seven on the north.

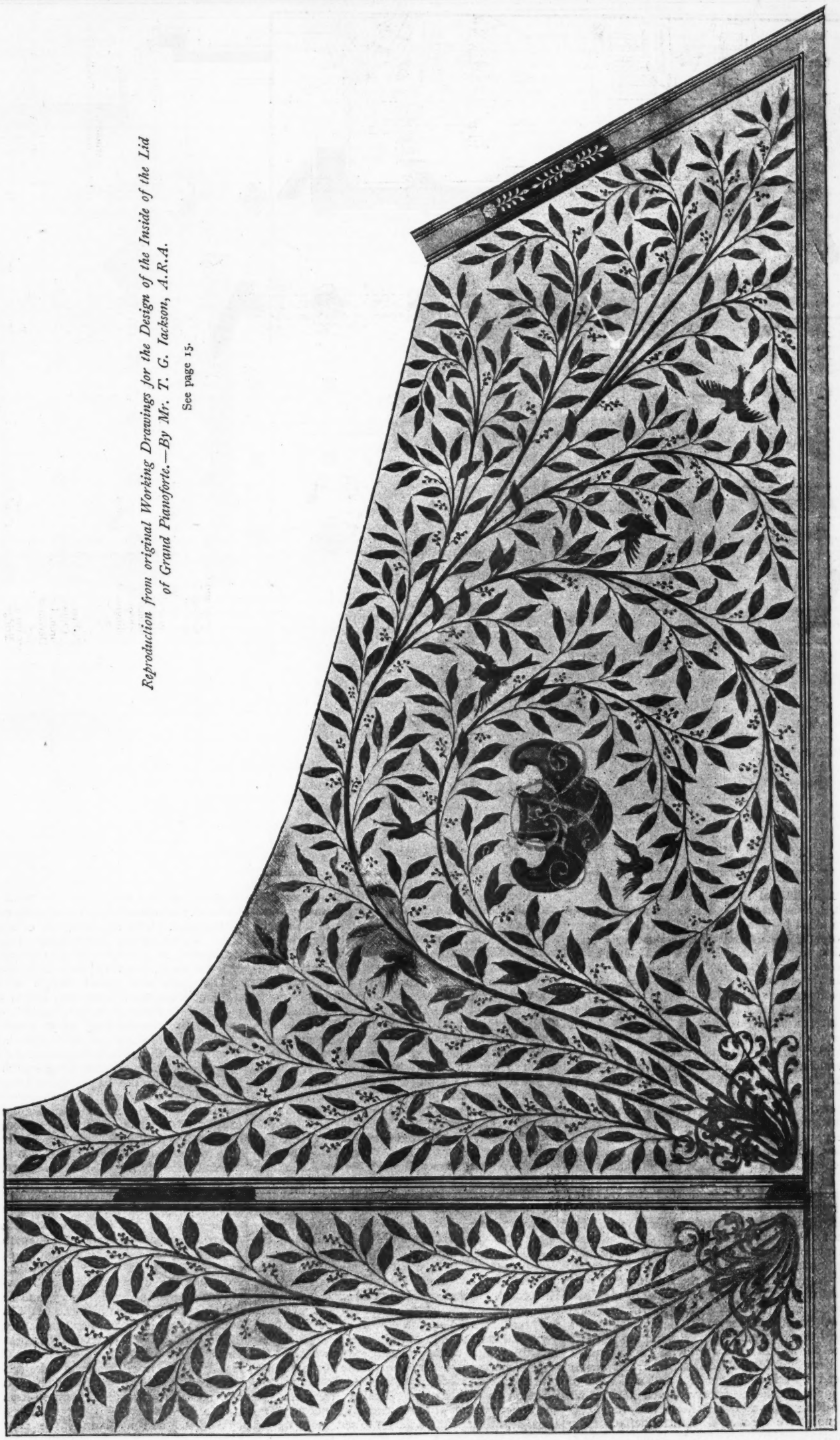
This brings us back to the central lantern and the transepts, in connexion with which is another point to which we will refer. The erection of the lantern in late Perpendicular times caused a considerable thrust on the trancept arcades, and pushed them out of the perpendicular. So serious was this that portions of the transept arcade were rebuilt nearest the lantern, although the upper portion seems to have been uninjured, and, consequently, was retained. This reconstruction seems to have included the Decorated piers of the arch north and south of the lantern on the west side of the transept, the filling in of the space between it and the Early English pier, and the rebuilding of the column which carries the two arches on the west side of the north transept nearest to the "Five Sisters." It is desirable to lay some stress on this point, as hitherto the rebuilt pier in the north transept and those next the Early English retained piers have been considered as belonging to the Decorated period. They will be found, however, to be of very different section to any of the Decorated work in the Minster, and although perhaps largely old stone re-worked, date undoubtedly from the period of the construction of the lantern, and are not part of the Decorated scheme. Professor Willis, in his exhaustive paper published in the York Volume of the *Archæological Journal*, makes the pier in the north transept Perpendicular on his plan, but, owing to what is evidently an error, refers to it in the text as "Decorated."

Amongst lesser points of interest in the plan is the west aisle of the north transept being wider than its corresponding aisle in the south, and the clever way in which the sacristies on the south of the choir have been worked with their lockers in between the eastern buttresses of the south transept. These sacristies were additions to the Early English choir, to which afterwards the Zouche Chapel (founded by Archbishop Zouche in 1351) was added. This group of smaller buildings was, consequently, in existence when Thoresby commenced his great work of rebuilding the presbytery, and the gradual diminution in the width of Thoresby's work may partly have been caused by a wish to retain the inner walls of these buildings as much as possible. As it was, the two sacristies were somewhat curtailed, and the Zouche Chapel had its north wall considerably interfered with, even if it was not, with its vaulting, entirely rebuilt.

Externally, as we have observed, the west front of York is not a very admirable composition; the ranges of niches in the lower portion of the buttresses have a fine and rich effect, but the treatment of the upper portions of the towers is very commonplace, and the break in the line made by the strongly-marked cornice with the pinnacles above it oversailing the wall line, and

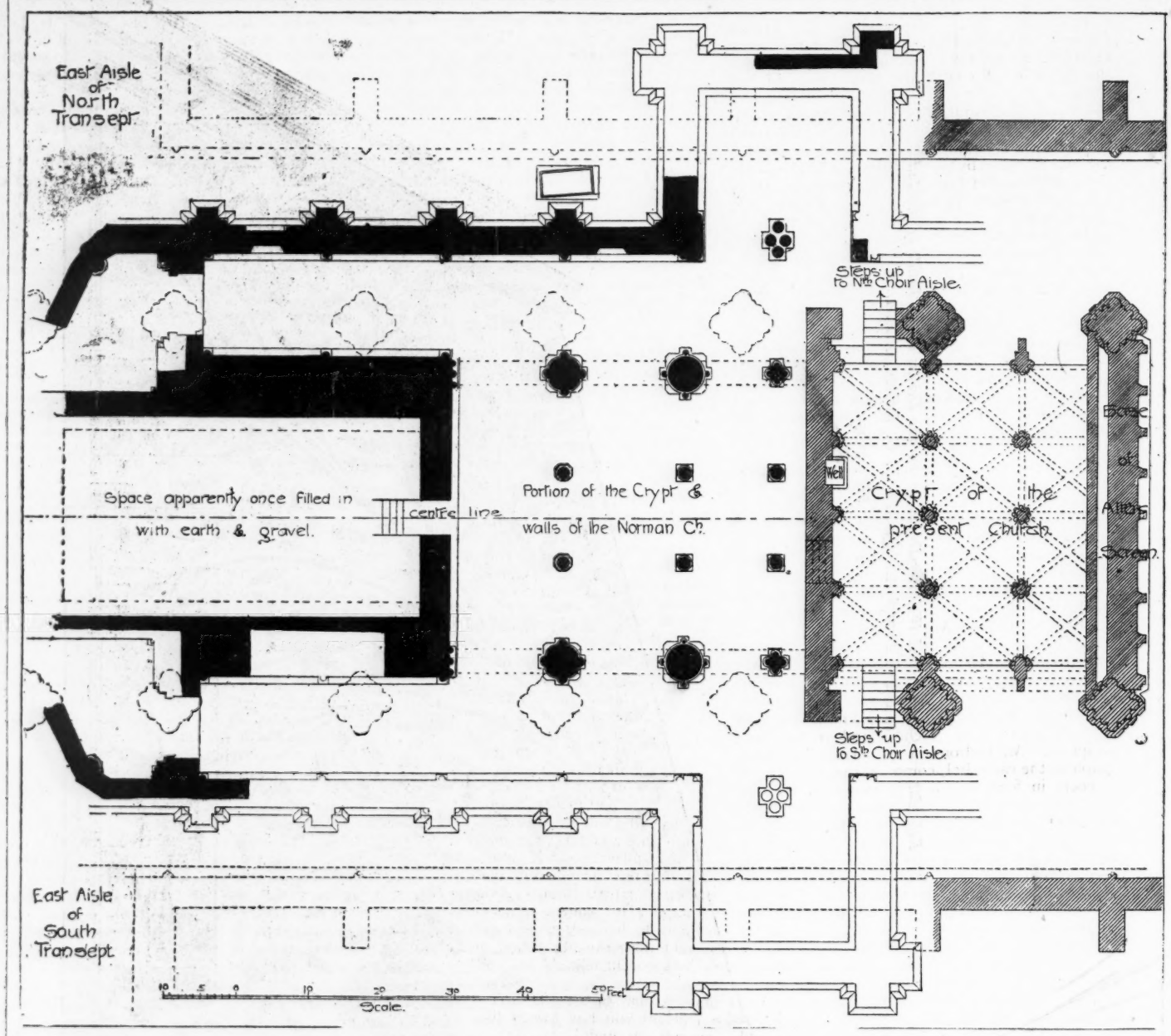
Key to Plate. "Some English Architecture of the Last Fifty Years."—References (beginning in extreme distance).

1. All Saints' Church, Paddington. W. White, F.S.A.
2. Marylebone Infirmary. Saxon Snell.
3. St. Thomas's Hospital. H. Currey.
4. Leeds Town Hall. Cuthbert Brodrick.
5. Municipal Buildings, Glasgow. W. Young.
6. St. Walburgh's Church, Preston. J. Hansom (Founder and First Editor of the *Builder*).
7. Picton Reading Room, Liverpool. C. Sherlock.
8. Walker Art Gallery, Liverpool. C. Sherlock and H. H. Vale.
9. Free Library and Museum, Liverpool. T. Allom & J. Weightman.
10. Town Hall, Portsmouth. — Hill.
11. Holloway College, Egham. W. H. Crossland.
12. University Museum, Oxford. Deane & Woodward.
13. Christ Church, Lancaster Gate. Francis and Francis.
14. Christ Church, Westminster Bridge-road. Paull and Bickerdike.
15. Royal Italian Opera House, Covent Garden. E. M. Barry, R.A.
16. Natural History Museum. A. Waterhouse, R.A.
17. All Saints, Margaret-street. W. Butterfield.
18. Dulwich College. C. Barry.
19. St. John the Baptist, Norwich (nave only, transepts and choir in course of erection). G. G. Scott, F.S.A.
20. Law Courts. G. E. Street, R.A.
21. Truro Cathedral (choir and transepts, nave in course of erection). J. L. Pearson, R.A.
22. Constitutional Club. R. W. Edis.
23. St. Andrew's, Willesden (choir and transepts, nave not yet erected). James Brooks.
24. House in Collingham-gardens. Ernest George & Peto.
25. Board School, Latimer-road. E. R. Robson.
26. Examination Schools, Oxford. T. G. Jackson, A.R.A.
27. Keble College Chapel, Oxford. W. Butterfield.
28. A portion of Taylor's Buildings, Oxford. Prof. Cockerell, R.A.
29. Holy Trinity Church, Sloane-street. J. D. Sedding.
30. House in Melbury-road. W. Burges, A.R.A.
31. Albert Memorial. Sir G. G. Scott, R.A.
32. Albert Hall. General Scott, R.E
33. Junior Boys' Quad and Chapel, Eton. Sir A. Blomfield & Son.
34. Marlborough College Chapel. Bodley & Garner.
35. House in Melbury-road. J. J. Stevenson.
36. Houses in St. James's-street. Norman Shaw, R.A.
37. Architectural Museum, Tufton-street. J. P. Seddon.
38. House at Kensington. P. Webb.
39. Church at Wimbledon. Somers Clark and J. T. Micklethwaite.
40. Preparatory School, Beaumont College. J. F. Bentley.
41. Houses at Collingham-gardens. Ernest George & Peto.
42. Well at Glossop. — Hadfield.
43. Two Houses, St. Raphael's-court, Woodside, Croydon. Somers Clark and J. T. Micklethwaite.
44. St. Leonard's Free Church, Perth. J. J. Stevenson.
45. Grey Friars, Chilworth, Surrey. F. A. Walters.
46. Spanish Church, London. Goldie, Child, & Goldie.
47. Church at Devonport. J. P. St. Aubyn.
48. Putney Bridge. Sir J. Bazalgette.
49. Westminster Bridge. Sir Thomas Page.
50. Blackfriars Bridge. Joseph Cubitt and Henry Carr.
51. Union Chapel, Islington. James Cubitt.
52. Houses of Parliament. Sir Charles Barry, R.A. (assisted by A. W. Pugin and E. M. Barry, R.A.).
53. Spire, St. Mary Redcliffe, Bristol. Completed by G. Godwin (third Editor of the *Builder*).
54. Headquarters of the Metropolitan Police. Norman Shaw, R.A.
55. The Carlton Club. Sydney Smirke, R.A.
56. The Royal Exchange. Sir W. Tite.
57. St. Martin's, Birmingham. P. Hardwick, R.A. & Son.
58. Doncaster Church, Yorkshire. Sir G. G. Scott, R.A.
59. Town Hall, Manchester. A. Waterhouse, R.A.
60. 61, and 62. St. Augustine's Church, School, and Dwelling House, Ramsgate. A. W. Pugin.
63. Victoria Courts, Birmingham, A. Webb and E. Ingress Bell.
64. Imperial Institute. T. E. Collcutt.
65. St. Stephen's Church, Westminster. B. Ferrey.
66. Glasgow University. Sir G. G. Scott, R.A., and J. Oldrid Scott.
67. Tower, Christchurch, Oxford. Bodley & Garner.
68. British Museum. Sir Robert Smirke.



Reproduction from original Working Drawings for the Design of the Inside of the Lid of Grand Pianoforte.—By Mr. T. G. Jackson, A.R.A.

See page 15.


East Aisle of North Transept
Steps up to Nth Choir Aisle.
Space apparently once filled in with earth & gravel.
centre line
Portion of the Crypt & walls of the Norman Ch.
Well
Crypt of the present Church.
Steps up to Sth Choir Aisle.
East Aisle of South Transept
10 5 0 10 20 30 40 50 Feet
Scale.

York Minster: Plan of the Crypts.—By Mr. H. R. Brakspear.

the vertical line of the buttresses entirely cut off from it, has a very bad effect. The doorways were restored by Smirke in 1845. On the south side of the cathedral the exceedingly tall pinnacles of the nave have an effect by no means monumental, the building seems to want solidity and simplicity and to be too much cut up and frittered in line. The south transept has not these defects, but it is not interesting nor refined in design, it seems to be spread out in its various portions in a rather mechanical manner, and the details and mouldings are in a large and coarse style. Eastward of the transept the south and north sides of the main building are nearly identical in design, and it is one of the characteristics of York, a cathedral in which architectural play of fancy seems to have been curiously limited, that the window tracery all ound the choir is of the same design, and as far as the ground story is concerned a poor design, which however is continued all round mechanically, and repeated in the smaller windows of the east front. The clearstory windows are indeed not of very interesting tracery design either, and th e tracery-bars are thin and starved-looking, as was frequently the case in late Gothic; but an interest is given to them by the singular and very unusual treatment of the design here, by which a mullioned screen is interposed in front of the window, of entirely separate design, the piers between these screens also standing out quite separately from the main wall, with a considerable space between. Effective shadows are of course produced by this arrangement, and a degree of effect given to the clearstory which the rather tamely-designed windows in themselves would certainly not have given. The introduction of the lofty narrow eastern transepts, breaking the line of the choir on each side, is a very fine and happy architectural feature, though the long window with its meagre mullions and poor tracery, does not make the more of the situation. The same may be said of the large east window, effective from its size but not from its design. On the other hand, the manner in which that is connected with the wall design by the wall mullions is a very good feature. Some of the carving in this portion of the building is very spirited and bold in execution, particularly the seventeen heads which are carved each in a square panel under the sill of the east window, and which form an interesting series of studies of Mediæval sculpture. The treatment of the buttresses and pinnacles at the east end is very picturesque and in some respects rather curious; the bases of the pinnacles are crowded with such a complicated mass of gablets and crockets and finials that until one gets close to them on the roof it is almost impossible to distinguish how they are set out; but the effect is rich, and furnishes a good base to the tall slender crocketed spirelets. The series of wall niches carried over the east front and round into the angle buttresses is a very telling feature, and the designing of the corbel tables and parapets to both upper and lower roofs is well worth attention; the main feature of the corbel table to the upper roof is a convex string of boldly carved conventional foliage, that to the lower roofs a series of heads or masks; the whole of the work here has been very well carried out and with an evident intention to produce a sumptuous piece of work.

The chapter house is one of the most characteristic features of the exterior. It may be a question whether the peculiar treatment of the upper portion of the buttresses is not an afterthought, arising from a desire to put more weight on them than was at first thought necessary; it is difficult to believe that they were really designed in this form; but the result, though it looks like a makeshift, is remarkably effective and picturesque. The adjoining bit of the vestibule also shows some interesting treatment of buttresses, in a very different manner from the chapter house, but very pretty in its way.

The solid and grand design of the north transept is known to everyone, and is one of the most famous features in our English cathedrals; and there is something very satisfactory and monumental-looking in the plain and severe treatment of the nave buttresses on the north side, which in our opinion is far superior in an architectural sense to the be-pinnacled busyness of the south side. The tower produces effect mainly by its mass and by the bold and simple treatment of the angles, which gives it a great look of power; the window treatment here, as elsewhere, is poor. The tower was probably intended to have angle pinnacles; there is little doubt that it gains in architectural effect by not having them, its square mass being far more dignified and impressive without them.

Internally York produces an effect by its remarkably spacious and lofty character, but it is a somewhat bare-looking interior, especially as far as the nave is concerned, and as Fergusson remarks, the open spacing of its wide arches prevents any sense of mystery, one sees through the building in every direction. It is not enriched with many monuments, nor are the existing ones of the highest order of interest in point of design. One of the most notable of the minor details to be found in the interior is the admirable wrought iron work on the ancient cope chest, of which we are enabled to give an illustration from a drawing by Mr. B. Walker.

We also add a plan of the crypt, all that remains of the Norman structure, for which we are indebted to Mr. H. R. Brakspear.

CHARTRES.

THE view, from a drawing by Mr. Joseph Pennell, we have called simply "Chartres," as it includes both the town and the cathedral, though the latter is of course the main object of the drawing.

Chartres Cathedral, as every one knows, is one of the most remarkable of the ecclesiastical monuments of France, and stands on the summit of a hill occupied by the chief town of the Departement of Eure and Loire, the old streets of which have so curiously preserved their Middle Age appearance.

The cathedral, which dates back to a foundation in the third century, has gone through numerous vicissitudes. The actual building has been erected on the site of a primitive Roman church. It was consecrated to "Notre Dame" in the middle of the thirteenth century.

Chartres is the largest of the metropolitan cathedrals of France. It is 138 mètres long and 33½ mètres wide, and the nave is 34 mètres in height. The capitals of the nave arcade offer a great variety of fine and interesting carving, and above the arcade is a fine triforium gallery surmounted by a lofty clearstory.

The west front is decorated with about 700 statues or statuettes, and is flanked by the western towers, with their two entirely different spires which give to the building the well-known and peculiar character of its west front. The more modern one, the "Clocher Neuf," of very elaborate design, is 122 mètres and a half in height; the Flêche, the highest in France, was partly built by Jehan de Beauce in 1507-14, and finished by Claude Angé, a carver, of Lyons. The "Clocher Vieux," about 112 mètres high, is of simple and severe architecture, dating from the twelfth century. The side portals, which are of the thirteenth century (except some slight alterations in the fourteenth), are well known for their rich treatment in architectural detail and sculpture. M. Didron, in an interesting monograph on the cathedral, compares the sculptures to a poem in four cantos of a conception, he says, more vast than that of the Iliad or the Æneid. He describes the first division as representing the cosmogony, the creation of organised beings; the second is an encyclopædia of the sciences and their commercial and industrial application; the third a moral treatise on virtues and vices; the fourth a manual of religious history, from the creation to the end of the world. On the left or north side are sculptured the personages of the Old Testament, on the south side those of the New.

The ambulatory surrounding the choir is a well-known and fine piece of work, commenced in 1510 by Jehan de Beauce. The bas-reliefs which decorate it illustrate the life of Christ and of the Virgin. In the middle of the choir is the high altar, which is decorated with a sculpture of the Assumption in marble, by Brideau. Behind the apse is a building separate from the church, which contains a chapel of the fourteenth century with some very rich stained glass.

Beneath the church is a large crypt, the largest to be found in France. It is 110 mètres long, and is decorated with some remarkable frescoes. The crypt is reached by five staircases, and contains fourteen chapels, as well as the well of the "Saints Forts," which is shown as the place into which Christian martyrs were thrown at the time of Diocletian—a story which may of course be believed by those who like to think that they are looking on the real scene of some ancient history, even without much evidence.

Mr. Pennell's drawing, though it can hardly be said to show the architecture of Chartres, or to be an architectural drawing in the sense in which the word is usually understood in our pages, gives a full idea of the way the cathedral sits on the top of the hill, and gives some idea of the character of the picturesque old city, besides being in other respects an admirable picture.

RESTORATION OF HADRIAN'S VILLA.

THIS restoration of the north-west face of Hadrian's Villa, by one of the ablest of the younger French architects of the day, formed one of the finest architectural drawings in a recent Salon Exhibition at Paris, and we give it not only as a fine drawing and an interesting archæological study, but also as giving our readers an idea of the kind of work which is done by French architects who go to pursue their studies at the Villa Medici at Rome, for this was a Prix de Rome drawing.

The Villa of Hadrian at Tivoli, of which the ruins occupy an immense space of ground, constitutes one of the most remarkable remains of Roman civilisation. It was the original conception of a man who was one of the most notable personalities of his time. Having travelled much to examine into the state of his empire, Hadrian wished to preserve a *souvenir* of the various countries he had seen. Hence this agglomeration of buildings of different styles and destinations. Along with habitations necessary for an Emperor and his suite are theatres, baths, and more or less faithful reproductions of the most remarkable edifices of other countries; a *suite* of buildings of all kinds, connected by splendid peristyles and porticoes, with domes, pediments, towers, terraces, and gardens all united in one sumptuous whole.

The north-west façade shows, above the terraces, the collection of habitations preceded by the Greek and Latin libraries connected by a portico sheltering the nine Muses, the statues of which were found among the ruins and are preserved in the Vatican Museum. Next to this comes the Nymphæum, then the Basilica and the Pœcile, preceded by a triumphal arch. At the rear is the auditorium. From the time of Hadrian to that of Heliogabalus, this splendid villa was successfully inhabited by Roman emperors, who, while making various modifications in it, added to its splendour and luxury.

Antoninus Pius, and after him Caracalla, began to despoil it of its art treasures to ornament their own palaces, but the actual ruin of the place probably happened at the invasion of Totila and his Goths in the Sixth Century; but in the Fifteenth Century there were still very considerable remains. Pope Pius II. who visited them, spoke of them with admiration. At the Renaissance period the site became the prey of a Italian commercialism, and a great many excavations were made in the hope of discovering statues or objects of art, and the whole ground was broken up; and these operations were unfortunately more injurious to the remains of Hadrian's Villa than the work of time or of barbarian conquest.

M. Esquié, the author of the drawing (one of a complete set for the restoration of the villa) was a pupil of M. Daumet; he obtained the Prix de Rome in 1882, a second medal in 1887; and a first medal in 1889, for this restoration.

"THE TREE OF LIFE:" DESIGN FOR MOSAIC.

THIS illustration, taken from a painting by Mr. Burne-Jones which was exhibited in the New Gallery a short time since, is the design for a Mosaic to be executed in the church built by Street for the American community in Rome.

We consider it one of the most beautiful designs Mr. Burne-Jones has ever produced. The figure in the centre seems to represent the cross, the tree of death, turned into the tree of life; the branching tree instead of the dead wood, the figure with outstretched arms no longer nailed to the cross, but extended in welcome. There is a beautiful feeling too about the subsidiary figures, which seem to stand as the representation of the human family; the man with his labour at breadwinning (indicated by the sheaf), the woman with her children and her flowers. Architects will not fail to notice the admirable adaptation of the lines of the design to those of the architecture, which is carried out in a true decorative spirit. But it is the spiritual feeling in the design which is its chief beauty.

"SUMMER": DECORATIVE PAINTING.

THIS is a reproduction from one of M. Puvis de Chavannes' large decorative painting, in the Hôtel de Ville, Paris; a painting occupying the end wall of a room, the door architrave cutting rather unpleasantly, it must be admitted, into the picture. A companion picture of Winter has been executed by the artist for another position in the same building.

In its general treatment, the picture is a notable example of skill in treating landscape in a decorative sense; it will be observed how all the lines of the landscape are kept nearly level, yet in an unforced manner; and the long sombre mass of trees in the background has a fine effect and gives a kind of monumental aspect to the landscape. The foreground bathers on the left are somewhat too realistic in spirit to harmonise either with the main design or with the graceful group on the left; but as a whole the picture is a very fine example of decorative painting.

DESIGN FOR A GRAND PIANO.

WE give two illustrations, from photographs, of the remarkable piano recently made by Messrs. Broadwood from the designs of Mr. T. G. Jackson, and we have also asked Mr. Jackson to allow us to give a reproduction from his full size working drawing for the inside of the lid of the piano; which will be found on another page (not among the lithographs). This, of course, is simply a working drawing, not a finished up illustration, and must be taken as such.

We already gave a brief note on this piano when it was exhibited at the makers; we add the following details with regard to the execution of the decoration, taken from a pamphlet issued by Messrs. Broadwood:—

"The outside of the piano itself is veneered with purple wood, stained an exceedingly dark green (not black), and the effect of the natural dye in the wood, combined with the chemical used, produces the appearance of a very fine old ebony. The surface is dull polished.

Elaborate *intarsiatura*, representing a profusion of lily stems, leaves, and blossoms in satin wood and pear tree, dissipate the sombreness of the dead black in a striking manner.

To heighten the effect, the blooms are made to scintillate with the iridescent tints of mother-o'-pearl, each lily being literally 'painted,' its centre being overlaid with transparent and variegated tortoise shell, through which a rich red enamel effectively gleams.

The top is fastened to the body of the piano by means of long and elaborately chased brass hinges of vine-leaf pattern."

The underside of the lid, of which we give the working drawing, is enamelled and lacquered in vermilion as a ground, on which the design of laurel leaves is executed in gesso. The centre ornament has been altered to a cypher since the working drawing was made, as may be seen on the photograph.

The instrument forms an object which there is little doubt will eventually find its way to some future museum of art, as an example of design in furniture. There are only two details we do not quite like in it; one is the shading of the escutcheons carrying the music inscriptions, so as to give them an appearance of relief. We cannot understand why that was done; it seems so much at variance with the whole principle of remainder of the design.

The other point we do not like is the introduction of the two scroll pieces underneath. We imagined they were necessary to the construction, and merely treated decoratively, but Messrs. Broadwood tell us they are no part of the construction. Why then introduce them? But these are minor matters, and the whole is a splendid piece of work; more especially the design of the supports, which ought to make a revolution in piano-legs.

COUNCIL CHAMBER, INSTITUTE OF CHARTERED ACCOUNTANTS.

THIS illustration shows a section through the Council Chamber of the new Institute of Chartered Accountants, of which building Mr. John Belcher is the architect.

The decorative treatment is admirably drawn by Mr. J. A. Slater. A cartoon for the large fresco on the centre wall is being prepared by Mr. Loudan, who is making a special study of this work; the architect thus hopes that not only will sculpture be represented in the building, but the sister art of painting also.

The external sculpture, by Mr. Thornycroft, R.A., and Mr. H. Bates, A.R.A., is nearing completion.

We may add that we gave a general view, with sections and plans of this building, in our issue for January 12, 1889; and a view to a larger scale of part of the façade, and plans, in our number for August 27 last.

NEW PREMISES, CHELSEA.

THIS illustration shows some new business premises, with residential apartments for assistants above. The buildings are now in course of erection in Sloane-square for Mr. D. H. Davies. The materials used for the front are light red bricks from the Laverstock and Acorn Company, and terra-cotta dressings and enrichments by Mr. J. C. Edwards of Ruabon, with Westmoreland green slates on the roofs. A considerable amount of iron and steel is being used in the construction, which is being supplied and executed by Messrs. Dorman, Long & Co. The work is being carried out by Mr. B. E. Nightingale, under the superintendence of Mr. F. G. Knight.

CHANGE OF A DISTRICT SURVEYOR'S OFFICE.—Mr. C. McDonell, District Surveyor of South-West Islington, St. Luke's, Old-street, &c., has removed his office to 12, City-road, Finsbury-square.

Books.

Electric Lighting, and Power Distribution. Part I. By W. PERREN MAYCOCK, M.I.E.E. London: Whittaker & Co. 1892.

NEITHER the size nor the scope of this little volume would of themselves entitle it to any detailed criticism, or single it out from the innumerable elementary treatises on the same subject that are continually pouring from the press. But the importance of a text-book is, in part at least, to be estimated by the number of students who are likely to use it; and the author's position as a teacher in the City and Guilds of London Institute, and elsewhere, makes it probable that a considerable number of students will acquire from this book their earliest ideas on its subject.

Mr. Maycock wisely begins with a chapter explaining the meaning of, and the distinction between, certain physical terms which occur in this as in all branches of Physics, the correct use of which is essential to all real progress in the subject. It is not, indeed, too much to say that the main distinction between the scientific and the pseudo-scientific is, that the former do, and the latter do not, know what they mean by *force*, *work*, and *power*.

Perhaps owing to the exigencies of space, Mr. Maycock is not so clear in this chapter as would be desirable. It is not enough to say that "force is that which produces motion or change of motion of matter;" the student should also be told that it is measured by the *rate* at which it changes the motion of matter, and *motion*, or *momentum*, should be defined. This, of itself, would put the student on his guard against the common error—suggested by an unfortunate name—that *electro-motive-force* is *force*. This error, indeed, Mr. Maycock seems rather to emphasise than to guard against. "*Electro-motive-force*," he says, "is a force producing or tending to produce a flow of electricity." No doubt Mr. Maycock only intended to point out the analogy between electro-motive-force and mechanical force, an analogy which (on the fluid theory of electricity) is partly true; but even so, it would be well to indicate where this analogy breaks down. He might even go further and suggest to his more advanced students that the true analogue to electro-motive-force is mechanical difference of potential.

"*Power is the rate of doing work*, and has nothing to do with the amount of work done." This statement is illustrated by two examples, of which the first is all that could be desired; but the last is a most unfortunate illustration, as the following extract from it will show:—"When the train was drawn to its destination, it (*sic*) would represent the same amount of work done, no matter whether it had travelled at the rate of a mile a minute or a mile an hour. This, of course, leaving friction and air resistance out of account." On most railway lines nearly the whole work is done against friction and air resistance, but perhaps Mr. Maycock is thinking of a mountain railway; if so, for the sake of the beginners, he should say so. As it stands, there seems to be some confusion between the rate of working and velocity, which are only proportional in the case of the force being constant. Space would be better used in making such matters clear, than in giving the figures 39371 six or seven times, with variation only in the position of the decimal point, as the value in inches of the various multiples or sub-multiples of the mètre, or similarly superfluous tables for the gramme, or in tediously ringing the changes on the different ways of delivering a Board of Trade Unit.

In Chapters III. and IV., in addition to a good deal of information common to all electrical text books, we meet with some six or seven rules connecting the direction of a current with its magnetic field. Of these it may be said that any one of them is better than Ampère's somewhat fanciful rule, but that Ampère's rule is better than *all* of them. Let the student choose his rule and stick to it, but not cumber his memory with "right hand rule," "clock face rule," "screw rule," &c., all repeated over again when a coil takes the place of a straight conductor.

Chapter V. deals with instruments of measurement, and is perhaps the best in the book. The instruments chosen for description are well selected, the descriptions are for the most part clear, and the illustrations are excellent. It is to be regretted that the mathematical limitations of the beginner preclude the proof of the formulæ for the Wheatstone Bridge, except in the case of equal arms; and it might have been an advantage to postpone any account of motor meters till the student should have read something about motors. The explanation of the modifications of Mr. Evershed's instruments for alternate current working must needs be unintelligible to the student who knows nothing of the laws of self-induction, nor what a transformer is. The difficulty, and the mode of meeting it, will be alike beyond his comprehension.

The last chapter deals with the dynamo, and can hardly be fairly judged apart from the second part of the book, which is promised shortly. We shall look with interest to it for an explanation of Mr. Maycock's method of classification of armatures; at present we prefer to regard the Brush armature as a modified ring armature, rather than, with Mr. Maycock, as belonging to the disc armature class.

Mr. Maycock is on the side of those who wish to extend and change our scientific vocabulary. "Inductance" is, no doubt, more convenient than "co-efficient of self-induction," but we can see no justification for "resistivity" and "conductance." The ugly word "mho," originating in an unhappy piece of scientific humour, has, we fear, "come to stay," but it is surely an abuse of language to say that "2 ohms $=\frac{1}{2}$ or 0·5 mho." The symbol = is not usually used for "is the reciprocal of." Such errors as the misprint in the figure on p. 26, and *zero* for *infinity* on p. 87, will, doubtless, disappear in a subsequent edition.

While we cannot agree with Mr. Maycock's somewhat strangely-expressed opinion that before the appearance of this book there was no elementary treatise on the subject which could be recommended to beginners, we have no doubt that students will find the present work useful as an introduction to the study of the electrical distribution of "power," whether for lighting or for other purposes.

A Study in Municipal Government (*The Corporation of Berlin*). By JAMES POLLARD, C.A., Chairman of the Edinburgh Public Health Committee. Edinburgh and London: William Blackwood & Sons.

THIS popularly-written sketch gives a good description of the municipal Government of Berlin, and deserves the attention of all persons interested in local affairs and general philanthropy. As the author says, we can indeed learn much from Berlin, especially where logical and systematic organisation is concerned; but we may point out that some of the best qualities of the administration he describes are counterbalanced by the effects of party antagonism, red-tape, and above all, by the over-bearing manners of the petty officials. We must congratulate Mr. Pollard on the general correctness and lucidity of his "study," although he has missed the *raison d'être* of some of the Berlin institutions, and has omitted speaking of such important ones as the Ambulance Service, or the *Staedtische Feuer Societaet*, with its compulsory mutual fire insurance. Although the author does not wish to express opinions, there is little doubt that he considers the Berlin arrangements models of their kind. A peep behind the scenes, which he has evidently not had, would, however, show him that the good results of splendid organisation are brought about by means and practices which we, in this country, would utterly reject. Mr. Pollard's little sketch may, however, be the means of suggesting some great improvements in our municipal affairs.

The Arbitrator's Manual. By J. S. SALAMAN, Solicitor. London: W. Heinemann. 1893.

THIS is a neat and well-produced little book, dealing clearly and shortly with arbitrations, and it is almost as satisfactory a manual on the subject as could be produced. The establishing of the London Chamber of Arbitration seems to be the primary cause of its production, but it would be quite as usual in arbitrations outside the Chamber of Arbitration as in those conducted by that tribunal. In regard to one practical point of importance, we are unable to agree with Mr. Salaman. He writes (p. 101) "In ordinary cases, unless there appears to be reason to throw the costs upon one side or the other, it is better to say that each party shall bear his own cost of the reference." The proper general rule is that the successful party shall obtain his costs from the other side, and this rule should not be departed from without the very strongest reason. It is one of the unsatisfactory fruits of lay arbitrations that costs are too often divided, whereby the successful party is deprived of some of the fruits of his victory.

THE INSTITUTION OF ELECTRICAL ENGINEERS.—In consequence of the unavoidable absence abroad of the new President, Mr. W. H. Preece, F.R.S., on the 12th inst., he will deliver his naugural address on the 26th inst.

TRADE CATALOGUES.

MESSRS. STANLEY BROS., of Nuneaton, recently sent us a useful and very complete illustrated catalogue of moulded and diapered bricks, encaustic and roof tiles, and terra-cotta goods, including ridges, finials, hip-knobs, string-courses, cornices, copings, gutters, chimney-pots, fire-bricks and fireclay goods, glazed sanitary stoneware, and enamelled bricks and tiles.

From Messrs. John Eede Butt & Sons, of Brighton and Littlehampton, we have received their new "Book of Moulding Designs," which are clearly shown and priced, so that the cost of any moulding can be at once seen. In addition to the usual stock patterns, the book contains some ten pages of "registered designs" for mouldings.

A catalogue of "patent specialities" in granite concrete and other materials has been issued by Messrs. B. Ward & Co., of Great George-street, Westminster. The material first named is shown in its application to stable and cow-house paving, stable-yards, &c. The catalogue also shows the application of what is termed "patent limestone concrete" to the construction of staircases and landings. It contains, too, particulars of artificial stone dressings, "in red, buff, grey, or green," stated to be "impervious to the action of the atmosphere."

Messrs. J. M. Bennett & Sons, of Ardwick Station, Manchester, send us their half-yearly catalogue, with priced details, of dry walnut, birch, oak, and ash logs. It is a very useful little book, and its arrangement is such that purchasers can see at a glance what will be the cost to them of any particular scantling.

Messrs. J. & G. Odhams, of Upper Thames-street, send us the fourth edition of their illustrated catalogue of electric bells, batteries, indicators, fire-alarms, &c.

Mr. W. H. Harling, of Finsbury-pavement, sends us illustrated catalogues of mathematical, drawing, and surveying instruments of all kinds, including his patent cone-fitting drawing instruments and Harrison's patent "clinograph."

Messrs. James Allan, sen. & Son, of Elmbank Foundry, Glasgow, send us two illustrated catalogues, one devoted to stable and cow-house fittings, and the other to baths and their fittings. They are both well worth attention. The first is prefaced by some useful notes on the erection of stables, the recommendations made being, we fear, "counsels of perfection" rather than, in the great majority of cases, attainable realities. The horse, we are told, being a more delicate animal than man, requires a great amount of care and attention to be kept in good health and in good working order. To attain this, particular attention ought to be given to site, size of stable, light, ventilation, and drainage. Too little attention has been devoted to this subject, and some useful hints may be derived from a perusal of Messrs. Allans' catalogue.

Correspondence.

To the Editor of THE BUILDER.

THE ORIENTATION OF CHURCHES.

SIR,—Your correspondent, Mr. J. H. Spencer [see *Builder* for December 24 last, p. 504], has done service in ascertaining how nearly the axes of the churches which he names agree in pointing to sunrise on the days of the Saints to whom they are dedicated. This is a task which, to the best of my knowledge, has never yet been undertaken with anything like system, which is matter for some surprise in these days, when critical tests are being applied so generally to elucidate what were merely conjectures in former years.

We have all heard in a vague way that the various differences of axis of one church in relation to another,—two neighbouring churches, it may be, are found to differ greatly in this respect,—are all to be accounted for by the position of sunrise on the day of the Saint to whom they may happen to be dedicated. It is extremely desirable that the subject should at last be examined and determined by the results of actual observation. But many more than three examples that are fairly right out of forty that, apparently, do not appear to be so to your correspondent, will be required before any reliable data can be obtained. It is likely also to follow that the three agreements that he has obtained by adopting three days of various events in the life of St. John-the-Baptist will not be found to exist with respect to other churches of similar dedication. There is an easy mode of testing. If your correspondent's researches have resulted in obtaining a rule, it will follow that other churches so dedicated will be found to agree with either one or the other of the axes of his three examples. In fact, all churches of this dedication would do so but for some of the contingent changes alluded to.

Your correspondent's conjecture with respect to St. Mary's, Truro, having been previously dedicated to St. Michael, on the evidence of the orientation alone, may be easily tested to a certain degree by his observing if many other churches dedicated to St. Michael have an axis pointed 5 deg. south of east. The test will be the easier since it will be assisted by the peculiarities of position not unusual to churches with this dedication,—peculiarities, which, by the way, do not exist at the example named. I doubt the results of the test, but it is worth applying on an extended scale.

Your correspondent will perform a much-needed service if he will prepare a list of what the angles of sunrise should be, say of a dozen or so of the days of the most popular of Saints. Were this in existence, the most busy even of your readers would be able to tell readily how any church of the dedications named agreed or differed. This list, to be of service, would have to be calculated for about a thousand years backward, and to allow for the precession of the Equinoxes. The date named would be a convenient one, since it would meet the fact that the greater proportion of our parish churches own their foundations from before the Conquest, while the largest proportion of the remainder were founded soon afterwards, there being but comparatively few of much later date until recent times. But it would not account for foundations of very early date.

With respect to the church at Llantony, stated to be dedicated to St. David, it has to be remembered that, so far as Wales is concerned, evidence points strongly in favour of the ancient churches having been founded by various princes and other religious men, and simply called after the names of their founders, without, it may be, any further dedication. They are, as a rule, well oriented, and whatever agencies may have produced this arrangement, the church referred to would most probably have followed them. These Welsh churches, and others in the West of England and elsewhere, require attention by students of orientation, for they indicate its use at a time anterior, it may be, of any rules of Saints' days of the Roman Church. This is of easy proof; for the dates assigned for their foundations are rendered by many of the Welsh chronicles. "There was, at least, no official communication between the Church of Wales and the Roman Church in England. And the latter church in Italy has always been, and still is, more or less indifferent as to orientation. Its missionaries in England are, therefore, not likely to have proposed it; and since it is found practised here so universally and at so early a period, it is a reasonable hypothesis that the Saxons learned it from their neighbours, as they did much of their art work, their polemical divisions notwithstanding; and that they found it on the spot in some of the ruined ancient churches of an earlier time.

It would be well that your correspondent, and others, should continue to trace any similarity of orientation in churches of the same dedication, even if only negative results be obtained, as I believe will be the case.

I do not think that any better hypothesis will be found than the belief that the axes of our ancient churches were obtained by the shadow cast from a pole at sunrise, set up when the builders were about to begin. This is sufficient to account for almost all the differences of position that are found to exist, and it will also account for the few remarkable examples which are met with in our own land and abroad, where the angles face the cardinal points. Of this arrangement the diagonals of circular Stonehenge are examples. But all systems of orientation are relics of customs of remote antiquity, far earlier than the advent of Christianity, and all researches in this most interesting subject, so prolific of results, will lead to an early period of time.

E. P. LOFTUS BROCK.

SOME ANCIENT WALL-PAINTINGS.

SIR,—Owing to absence I regret having omitted to notice a letter in the *Builder* of November 19, page 401, from Mr. P. H. Newman. Mr. Newman, in speaking of the wall-paintings of Eastbridge Hospital, Canterbury, says they "have suffered greatly from exposure to the air and moisture since their structural restoration by Mr. Neale." I fear Mr. Newman has not been careful as to his facts. I in no way "restored" these paintings, and should be strongly opposed to the "*restoration*" of them or any other ancient wall-paintings. Some thirteen years ago at the end of the hall existed a modern brick fireplace and chimney; on removing this I discovered traces of what appeared to be wall-paintings. Some six coats of whitewash were removed, and exposed a daub of a portion of the "royal arms." I then found indications of an earlier painting; more coats of whitewash were removed, and exposed to view the interesting wall-painting, the central portion consisting of a vesica enclosing a life-size picture of our Saviour seated upon a throne; the emblems of the Four Evangelists surround the vesica, each enclosed in a circle. A great part of St. Luke had been cut away to allow the flue of the modern fireplace to pass through the wall. Immediately beneath the vesica was another painting about 4 ft. high—our Saviour and the Apostles at the Supper; Jesus giving the sop to Judas. There are fragments of a painting of the murder of Becket on the eastern side of the central subject, but this is of a later date than the fine work it adjoins, and inferior to it in execution. On the western side was a painting—much destroyed—apparently showing Henry II. doing penance at the shrine of Becket.

The method pursued for the preservation of the paintings was somewhat hazardous, but extremely successful, as far as can yet be seen. The wall is of chalk, roughly plastered over. Upon this rough plaster is a thin coating, about ⅛ in. thick, of fine plaster, and upon this the subjects are painted. What was once rough plaster next to the chalk wall was, when examined, found to be loose sand, only held in its place by the hard skin of plaster under the painting, and not held in everywhere by that, for holes had been made in the surface, and the sand ran out through them. Boards were placed against the painting, and the sand encouraged to run out by gentle tapping. Copper and slate dowels were then let into the wall in a number of positions under the larger cavities. The chalk of the wall was saturated with water, driven in from a large garden syringe. Then the cavities were packed with old Portland cement, and cleansed flint road drift, nearly in a semi-liquid state, applied in very small quantities at a time. This solidified round the dowels, making thus the most thorough attachment to the wall in all positions. The incrustations of smoke and dirt were then attacked, spirits of wine and water, applied with a fine syringe moistened the whole, and the coatings were taken off in small flakes. A somewhat similar process was employed by me in repairing the paintings in St. Gabriel's Chapel in the crypt of Canterbury Cathedral.

I saw the Eastbridge paintings recently, and so far as I remember they showed no signs of fading since I uncovered them in 1879. I gather Mr. Newman intimates having treated these paintings with a preservative solution. I trust his solution will not act in the manner of many other solutions, and end in the destruction of the paintings. Mr. St. John Hope asks Mr. Newman in yours of December 3 as to the nature and properties of the preservative solution which he applied to these and other paintings. Perhaps Mr. Newman will kindly satisfy your readers on this point. I agree with Mr. Hope as to the sad fate of many wall paintings, owing to the use of "preservative solutions."

When I uncovered the paintings I made careful copies of the size of the originals, so it is easy to see if any of the painting has disappeared.

An excellent description of the paintings and method of "preservation" was given in the *Builder* of July 26, 1879, and a portion of this letter is extracted from your description.

JAMES NEALE, F.S.A.

10, *Bloomsbury-square, London*,
December 31, 1892.

LOW SIDE WINDOWS.

SIR,—In the article on this subject in your last issue, modern antiquaries are said to ignore the mediæval tradition of the term "Leper Window," and its historical associations. But, in fact, the term is only some forty years old, having been invented by Mr. Street on the discovery of a distemper painting behind the stalls in the chapel (I think) at Windsor, supposed to represent a leper being communicated at one of these windows.

Whether this conjecture were correct or not in the particular instance, it is much more likely that these windows, being in connexion with the site of the stalls, would be for confessing than for communicating, for which the arrangement would be most inconvenient, and in very many cases impossible.

I contend that these windows were for a very different purpose, connected with the burial of the dead. I think it will be found that in nearly all cases they overlook that portion of the churcyard which was used for burying. And prior to the period when the body was brought into the church, it was the custom to open this window for the priest to say the greater part of the office. In several notable instances there is on the jamb of the window a projecting book-ledge, which would indicate some sort of office being said within connected with an outside ceremony, the window being in all cases shuttered and not glazed.

WILLIAM WHITE, F.S.A.

*** We may call Mr. White's attention to the fact that initials were appended to the article, to indicate that while considering the article of interest, we did not make ourselves responsible for all the opinions expressed in it.

SIR,—The writer of the interesting communication on low side windows in your last issue is apparently unaware of the existence of a very instructive example at Ely. Prior Cranden's Chapel, or oratory, a little gem of fourteenth century work, though thoroughly lighted by six large windows, has a low window of charming design in each of its north and south walls. The chapel is built upon a crypt, or under-croft, of considerable height. Hence the external cills of these windows are at a level of some 10 ft. or 12 ft. above that of the ground, and there could be no peeping in from the outside by lepers or any other persons unless ladders were reared up for the purpose.

The tinkling of a hand-bell from either of these windows seems improbable, when it is remembered that the chapel was the private oratory of the Prior, and had no concern with citizens dwelling outside the precincts of the abbey: such a tinkling would have been audible only to the members of his household. Moreover, the chapel has a bell-cot, in which the sanctus-bell was probably hung. This bell-cot forms the termination of a newel staircase at the north-west angle of the building, and as I can discover no trace of friction or grooving by a bell-rope, I fancy the bell was struck at the proper moment by a person posted at the head of the stairs, where there is a niche or recess in which he possibly stood. Standing there, he would be within 6 ft. of the northern low window, and would supersede the necessity for opening it and ringing a hand-bell.

Are we bound to assume that these windows had any practical utility? May they not represent a mere freak or fancy of the wealthy and powerful churchman who built the chapel, and who had at his elbow a true artist, Alan of Walsingham—*flos operatorum* in his generation—to carry out his wishes?

W. E. DICKSON
(Sacrist of Ely).

The Student's Column.

CHEMISTRY.—I.

INTRODUCTION.

SOME knowledge of Chemistry is so essential to those who would fully understand the principles of sanitation, the composition of building materials, the "setting" of cements, the "weathering" of building stones, and many other matters connected with building, that it is now recognised by architectural societies as a useful and almost necessary study for those in the profession.

It is proposed in the following papers to treat the subject as simply as possible, assuming no previous knowledge of the science on the part of the intending student, omitting all mention of the rarer elements and their compounds, but describing in fuller detail than is usual all subjects directly connected with building or sanitation.

It must not be supposed, however, that it is possible to master any *experimental* science, such as Chemistry, by reading alone. It is necessary for the student to manufacture and examine the various elements and their compounds for himself; but as nearly all the apparatus and reagents required for the experiments to be described can be obtained for very small sums, there is no reason why, by combining theoretical with practical study, he should not obtain a sufficient grasp of Chemistry and its principles to enable him to turn that knowledge to useful account in his professional work.

Elementary Principles of Chemistry. — All bodies, whether gaseous, liquid, or solid, are said to be composed of *matter*, and it is the object of chemistry, by the combined aid of experiment, observation, and inference, to investigate the composition and character of every form of matter and to discover the laws which regulate the behaviour of these bodies under various conditions. This investigation has led to the division of all kinds of matter into two classes, viz., (1) ELEMENTS, or substances that cannot be split up into simpler forms, and (2) COMPOUNDS, which are substances formed by the combination of two or any greater number of elements. Copper, for example, is called an *element*, as it cannot be decomposed into two or more different substances; but "blue vitriol," which is so largely used in the manufacture of Scheele's green and other copper pigments, is a *compound*, as it can be split up into the elements copper, hydrogen, sulphur, and oxygen.

About sixty-seven elements have been discovered up to the present time, but as new elements are occasionally discovered, and as some of those substances at present believed to be elements may be found to be compounds, it is impossible to state exactly the number of elements existing in our earth. It will be readily understood, however, that with such a large number of substances, some classification is needed, for the sake of convenience. The elements are therefore divided into metals and non-metals, and the difference between most of these is so well-known as to need no description here. There is, however, no hard-and-fast division between them, for two or three of the elements combine some metallic properties with some non-metallic properties.

The following list of the most commonly occurring elements is not intended to be learnt by heart, but is merely given for reference when

necessary. The metals are printed in small capitals, the non-metals in the smaller letters :—

Name.	*Symbol.*	*Approximate Atomic Weights.*
ALUMINIUM	Al	27
ANTIMONY (Stibium)	Sb	120
Arsenic	As	75
BARIUM	Ba	137
BISMUTH	Bi	207·5
Boron	B	11
Bromine	Br	80
CALCIUM	Ca	40
Carbon	C	12
Chlorine	Cl	35·4
CHROMIUM	Cr	52·4
COBALT	Co	58·7
COPPER (Cuprum)	Cu	63
Fluorine	F	19
GOLD (Aurum)	Au	196·2
Hydrogen	H	1
Iodine	I	126·5
IRON (Ferrum)	Fe	56
LEAD (Plumbum)	Pb	206·4
MAGNESIUM	Mg	24
MANGANESE	Mn	55
MERCURY (Hydrargyrum)	Hg	200
NICKEL	Ni	58·6
Nitrogen	N	14
Oxygen	O	16
Phosphorus	P	31
PLATINUM	Pt	194·5
POTASSIUM (Kalium)	K	39
SILVER	Ag	108
Silicon	Si	28
SODIUM (Natrium)	Na	23
Sulphur	S	32
TIN (Stannum)	Sn	118
ZINC	Zn	65

Atoms.—In order to explain the property which each element possesses of always combining with other elements or compounds in a certain *definite proportion*, or some multiple of that definite proportion, Dr. Dalton proposed his Atomic Theory, in which it is assumed that—

1. All matter is made up of atoms.
2. These atoms are *indivisible* particles.
3. All atoms of one element possess the same weight.
4. All atoms of different elements possess different weights, and
5. Chemical combination consists in the approximation of the individual atoms to one another.

The *absolute* weights of the atoms are unknown, but their *relative* weights, as compared with hydrogen, the lightest substance known, are represented by what are called the atomic weights of the elements, which are shown in the third column in the list of elements just given.

Definition of Atom and Molecule.—An *atom* is the smallest quantity of any element which can enter into or be expelled from a chemical compound. A *molecule* is the smallest quantity of any element or compound capable of existence *in a free state*. It usually consists of a group of two atoms, and is supposed to be indivisible by *mechanical* means. There are, however, exceptional cases in which the molecule consists of only one atom, while the molecules of arsenic and phosphorus contain four atoms.

Chemical Equations.—The writing of equations representing the chemical reactions which take place when two or more substances act upon one another is of considerable importance to the chemist, forming, as it does, a convenient and very simple method of shorthand, and should be thoroughly mastered. Each element has a symbol attached to it which is either the first letter of its English or its Latin name, or the first joined with another of its constituent letters. Thus H represents hydrogen, Fe (Latin name, ferrum) iron, Cu (cuprum) copper, while Ca is taken to represents calcium, as C by itself represents carbon.

A symbol, however, not only represents a certain element, but also such weight of that element (taking hydrogen as unit) as is indicated by its atomic weight. Thus, C represents 12 parts by weight of the element carbon ; O, 16 parts by weight of oxygen ; N, 14 parts by weight of nitrogen.

In writing an equation the sign + is placed between the substances used to produce the chemical reaction, and also between the different substances produced after the reaction. The sign = represents the word "yields," thus

$$\begin{array}{ccc} C + O_2 & = & CO_2 \\ 12 + 32\ (16+2) & & 44 \end{array}$$

expresses the fact that when 12 parts by weight of carbon are brought into chemical contact with 32 parts by weight of oxygen, 44 parts by weight of CO_2 or carbon dioxide are produced. Similarly,

$$H_2 + O = H_2O$$

expresses the fact that 2 parts by weight of hydrogen will combine with 16 parts by weight of oxygen to yield 18 parts by weight of H_2O, *i.e.*, water.

It will be well to remember that no chemical reaction can be correctly expressed if the sum of the quantities by *weight* on the left-hand side does not *exactly* equal the sum of the quantities by weight on the opposite side, for it is one of the rudiments of Chemistry that nothing can be destroyed, nothing created.

Chemical equations also indicate the quantities by *volume* which take part in a chemical reaction, thus the equation—

$$C + O_2 = CO_2$$

indicates that one volume of carbon will combine with two volumes of oxygen to produce one molecule, *i.e.*, two volumes, of CO_2 or carbon dioxide. With a few exceptions, all molecules may be considered as consisting of two volumes.

Now in this volume equation it will be noticed that three volumes of the elementary gases only form two volumes of the compound gas, and therefore the sum of the quantities by volume are not equal on both sides of the equation. If, however, the three volumes and the resultant two volumes were weighed at the same temperature and pressure, they would be found to have exactly the same weight. Nothing, therefore, has been lost, and the elements, carbon and oxygen, may be regarded as having condensed somewhat while chemically combining to form the compound CO_2, which is entirely different in its properties to either carbon or oxygen.

Similarly, the equation

$$H_2 + O = H_2O$$

shows that two volumes of hydrogen when chemically combined with one volume of oxygen only yield two volumes of water vapour, yet the sum of the quantities by weight upon each side of the equation are equal.

Symbol O *Oxygen Atomic weight* 16.

Oxygen is a colourless and odourless gas. It exists in a free state in the atmosphere, of which it forms about one-fifth part by volume. In a state of combination with hydrogen, oxygen constitutes eight-ninths of the total weight of water. As all attempts to split up the gas into simpler form have failed, oxygen is considered as an element. It combines with all the elements, except fluorine, to form *oxides*, and is a constituent of most of the substances forming the earth's crust. It enters into the composition of all building stones, marbles, clays, and most paints, and is, in fact, by far the most abundant element known. Many oils, such as linseed oil, combine with the oxygen of the air, which causes them to thicken, and finally become solid or dry if in sufficiently thin layers. One of the chief objects in adding "dryers" to paint is to accelerate this action by supplying the oil with a good oxygen-carrier, and it is found that those substances which contain the most oxygen in their composition make the best driers.

When a substance combines chemically with oxygen, it is said to undergo *oxidation*, and as the act of oxidation *always produces heat*, it will readily be understood why a collection of oily rags or "waste" left in a room or workshop for many hours will sometimes become spontaneously ignited, and thus set fire to a building. If cotton-waste was a good conductor of heat there would be no danger of spontaneous combustion taking place, but as it is a very bad conductor, it prevents the heat produced by the oxidation of the oil from escaping, and consequently through the gradual accumulation of heat a sufficiently high temperature is at last reached to cause the material to burst into flame.

Preparation of Oxygen.—Oxygen can be prepared from a great number of substances. Its extraction from the atmosphere is attended by many difficulties, and is not therefore resorted to for the preparation of the gas on a small scale.

Experimentally it is best obtained from potassium chlorate ($KClO_3$). This substance, when heated, is decomposed into oxygen gas and potassium chloride (KCl), thus :—

$$2KClO_3 = 2KCl + 3O_2.$$

The reaction really occurs in two stages, thus :—

$$2KClO_3 = KCl + KClO_4 + O_2,$$

and then at a higher temperature,

$$KClO_4 = KCl + 2O_2.$$

If the $KClO_3$ is mixed with about one-fifth of its weight of black dioxide of manganese, the oxygen is evolved more readily and at a lower temperature, but is not so pure. The oxide of manganese itself undergoes no permanent change, its action being merely a catalytic or contact one. Many other chemical reactions are effected by the contact action of a substance which itself undergoes no chemical change, but the cause of this action is by no means fully understood.

SURVEYORSHIPS.

BIRKENHEAD.—The Road and Improvement Committee of the Birkenhead Town Council has resolved to recommend Mr. Charles Brownridge, A.M.Inst.C.E., F.G.S., the assistant and Deputy Engineer of Leeds, for the post of Engineer and Surveyor to the Borough, rendered vacant by the retirement of Mr. T. C. Thorburn. The salary is 500*l.* a year. The recommendation was adopted by the Birkenhead Town Council on Wednesday, and Mr. Brownridge was elected.

BRIDGEND (GLAMORGANSHIRE).—The Bridgend Local Board have just appointed a new surveyor. There were about 120 applicants, and the following three appeared before the board :—Mr. F. R. E. Willoughby, Cardiff; Mr. E. C. Jones, B.Sc, Neath ; and Mr. Morgan Williams, Bournemouth. Mr. Williams was elected. The salary is 150*l.*

GENERAL BUILDING NEWS.

BUILDING IN ABERDEEN DURING 1892.—During the past year there has been abundance of work for masons and others engaged in the house-building trade in the "Granite City." In the course of the twelvemonth a great many buildings have been finished, the most notable of a public character being the Jubilee extension of Aberdeen Royal Infirmary (charitable, general medical, and surgical hospital), and the new Free Library buildings and the new Free South Church, which two stand side by side on the Rosemount Viaduct, near the Wallace Statue. Among extensive buildings just approaching completion may be mentioned the Grand Hotel in Union-terrace, the new offices for the G. N. of S. Railway Company, in Guild-street, and the addition to the Girls' High School in Albyn-place. At the end of 1891 the municipal boundary was considerably extended, so as to include the burghs of Woodside and Old Aberdeen, and also the village and new suburb of Torry, in Kincardineshire—an area of about ten square miles. The jurisdiction of Aberdeen Town Council extended over all this area during the whole of the year 1892 ; and the plans of buildings approved of by the Council's Plans Committee from January to December may be classified as follows :—Dwelling-houses, 60 ; alterations and additions at various premises, 75 ; manufactories, workshops, warehouses, and mills, 22 ; cottages, 16 ; shops, 6 ; halls, 2 ; hotels, 2 ; hospital, 1 ; church, 1 ; and miscellaneous (including stores, sheds, stables, greenhouses, washing rooms, outhouses, and small business offices), 33. It may be explained that the expression "dwelling-houses" generally refers to large tenements to accommodate eight, ten, or twelve families, frequently with shops on the street floor, and that under the phrase "alterations and additions" a goodly number of varied and extensive operations are included. Among the largest of projected structures are the extension of the University Buildings (at a cost of about £100,000) ; the extension and remodelling of the Aberdeen Royal Lunatic Asylum (to cost £50,000) ; the enlargement of the Town Council's City Hospital (for zymotic diseases) ; and a "citadel" (including meeting halls, shops, offices, and dwelling apartments) for the Salvation Army. The Town Council has executed large improvements at the gardens and streets at Union-terrace, and in the widened thoroughfare a bronze statue of the poet Burns has been placed. At the east end, Justice-street, as widened and altered, has had its old and shabby-looking buildings replaced by substantial modern edifices. Extensions at a cost of £90,000 are to be made on the Corporation gasworks. The operations of the Aberdeen Harbour Board do not call for particular mention, beyond stating that £12,418 odd has been spent for new dredging plant and that the work of securing the foundations of the North Pier, building parapet, and paving roadway, has now been completed at a cost of nearly £10,000, as well as the extension of cattle lairage for foreign animals at an expense of £3,670.

GYMNASIUM, MONMOUTH.—The Monmouth Gymnasium, which has been presented to the town by Lord Llangattock in commemoration of the coming of age of the Hon. J. M. Rolls, in April, 1891, was opened by his lordship on the 29th of December. It is a new and fully-equipped building of the mixed Tudor and Elizabethan style, faced with rock rubble local stone, with dressings of Box Ground Bath stone. The roof is covered with Phillips' patent tiles. The accommodation on the ground floor consists of a ticket office, a convenient hall, spacious reading and smoking room, dressing room, bath room fitted with hot and cold water, and large lavatory ; the whole of this floor is laid with Wilkinson's granolithic cement. All the walls are lined with match-boarding stained and varnished. The floor over is constructed of fireproof materials executed by Messrs. Homan & Rodgers, of London. From the hall a staircase leads to the gymnasium, a room 53ft. long, 32ft. 6in. wide, 17ft. high at sides, and 36ft. high to ridge, with large bay at end. An open timbered roof covers this room, and a spacious gallery extends across one end for visitors. The whole of the interior is lined with match-boarding, including the roof, and the window openings are filled with lead quarry glazing with iron sashes and frames, with provision for ventilation. The building

will be warmed with hot water pipes, and will be lighted by gas. The fittings of the gymnasium have been supplied and fixed by Herr Adolph A. Stempel, of London, and comprise apparatus for nearly all kinds of exercises. Mr. Henry Pope, of Winchmore Hill, London, was the architect; Mr. James Morgan, Rockfield, Monmouth, being the builder, and the works were carried out under the direction of Mr. Thomas Pembridge, Monmouth. The cost of the building—a little over £2,000—has been wholly defrayed by Lord Llangattock, who has also promised £50 a year towards its support.

PARISH ROOM, WOLVERTON ST. MARY, BUCKS.—A new parish room 40 ft. by 18 ft., with porch, class-room, and the usual offices has been opened at Wolverton St. Mary. The dedication stone was laid in August last by the Right Hon. A. W. Peel, Speaker of the House of Commons. It was built at the cost of the Rev. W. P. Trevelyan, the father of the present vicar. The materials used are local limestone, red brick, and flints, and Monk's Park Bath stone has been used sparingly in dressings. The roofs are open-timbered, "left from the tool," and covered with selected old tiles and capped with Cooper's ridges. The builder is Mr. H. Walker, of Wolverton St. Mary, and Mr. E. Swinfen Harris, F.R.I.B.A., of London, is the architect.

THE JUNIOR CONSTITUTIONAL CLUB, PICCADILLY.—Respecting this building, which was described in our issue for December 10, p. 466, the Bostwick Gate and Shutter Company write to say that they made and fixed the whole of the wrought-iron lift-screens and Bostwick gates to the elevators.

SANITARY AND ENGINEERING NEWS.

THE WATER OF LEITH SEWERAGE AND PURIFICATION SCHEME.—An important stage in this great work was reached on the 26th ult., when (as we learn from the *Scotsman*) the sewer was joined up in the Blandfield Tunnel, Bonnington. The pipe is now completed from Balerno to the sea. The sewer begins at Balerno with an 18 in. pipe, and increases in size to 4 ft. 6 in., and eventually to a tunnel 7 ft. 6 in. by 8 ft. 6 in. Thence the sewage is taken by 5 ft. iron pipes to the sea at the Black Rocks. It was expected that the sewer would have been joined up three months ago, but great difficulties were experienced in building the Blandfield Tunnel, and operations were retarded on that account. The tanks, settling ponds, and drains in connexion with the mills and works in the Water of Leith Valley are now well advanced, so that it is expected that the whole scheme will be in operation in the course of the next six months. In the meantime, the effect of the work accomplished last week will be that the sewage can now be taken direct to the sea. That will relieve the old drain made in 1864, which on account of its limited carrying capacity has of late overflowed into the river in time of rain. The two pipes will now be sufficient to drain the whole Water of Leith district from Balerno to the sea for many years to come, even supposing the drainage area were fully built over. The Parliamentary Estimates for the work amounted to 145,000*l.*, but these have been greatly exceeded, chiefly on account of the unexpected increase on compensation claims. The borrowing powers of 200,000*l.* which the Commissioners had under their original Act are now all but exhausted, and a Bill is being promoted asking for additional borrowing powers to the extent of 75,000*l.*

STAINED GLASS AND DECORATION.

NEW WEST WINDOW, CANTERBURY CATHEDRAL.—A new west window has just been placed in St. Anselm's Chapel in Canterbury Cathedral. It is the gift of Mrs. Rutson, a niece of Canon Holland, and is the work of Messrs. Clayton & Bell. The subjects of the window are as follows:—The two Archbishops, Simon of Mepeham, and Thomas Bradwardine, both of whom are buried in St. Anselm's Chapel, occupy the main portion of the window. The four medallions are filled with scenes from the lives of the archbishops named. The work now in progress in the Crypt, under the care of Sir Arthur Blomfield as architect, consists in excavating to the original floor level, and paving with stone.

WINDOW, ST. GEORGE'S CHURCH, STALYBRIDGE.—The east window of St. George's Church, Stalybridge, has been filled with stained glass to commemorate the jubilee of the consecration of the church. The window consists of four lights and tracery. The principal subjects are the Nativity, Crucifixion, Resurrection, and Ascension of our Lord. The window has been executed by Mr. Wm. Pape, Leeds, Messrs. Eaton & Sons, of Ashton-under-Lyne, being the architects.

WINDOW, MURROES PARISH CHURCH, FORFARSHIRE.—A stained glass window, the gift of Mr. Robert M'Gavin, of Ballumbie, has just been placed in the church of the parish. The window is the work of Messrs. Ballantine & Gardiner, Edinburgh.

WINDOW, LARGS U.P. CHURCH, AYRSHIRE.—Messrs. J. & W. Guthrie, of Glasgow, have just completed a stained-glass window to be erected in Largs U.P. Church. This is the fifth of a series of windows for this church which have been executed by the same firm, the others being now placed.

FOREIGN AND COLONIAL.

FRANCE.—Paris will shortly witness the erection, in the garden in front of the south pavilion of the colonnade of the Louvre, of the equestrian statue of Vélasquez, by M. Frémiet. This work, which was exhibited in the Salon of 1890 (and of which we gave an illustration in the *Builder* for July 5 of that year) will commence the series of nineteen statues which, with the monuments to Meissonier and Raffet, will eventually adorn the gardens which surround the Louvre.——In the Spring there will be placed in the gardens of the Luxembourg a number of vases and decorative objects which remain unutilised at the national manufactory at Sèvres, and which the Architect to the Senate, M. Scellier, of Gisors, has asked of the State for the ornamentation of the flower-beds.——The Conseil-Général de la Seine has at last decided on the suppression of the prison for juvenile offenders known as the "Petite Roquette," which stands opposite the Place de la Roquette, where the executions for capital offences are carried out. This prison, as barbarous as demoralising in its treatment of offenders, will be replaced by an educational house of correction, to be erected at Montesson (Seine-et-Oise) from the plans of M. Poussin, architect.——The same body has refused to sanction the construction of a very useful bridge which the administration wished to construct over the Seine between Neuilly and Puteaux.——The Committee of the Société Nationale des Beaux-Arts has unanimously elected M. Auguste Rodin to be President of the Section of Sculpture, in the place of M. Dalou, resigned.——The association of pupils of the School of Fine Arts at Lyons have inaugurated their new premises, which have been built in the Rue de la Platrière.——A fine-art exhibition was opened on the 1st inst. at Carcassonne (Aude).——M. Gustave Germain, the sculptor, has finished the monument which will shortly be erected to the memory of Captain Meyer, of the Artillery, who was last year killed in a duel with the Marquis de Morès, after a controversy on the Jewish question. The monument, to be erected in the Mont Parnasse Cemetery, consists of a pyramid, on which is sculptured a palm wreath surrounding a portrait medallion of the deceased; below is a sword and a laurel wreath.——The work of prolonging the Sceaux railway as far as the Luxembourg is being pushed on with great activity, and a commencement is being made with the construction of the long tunnel which will extend from the existing terminus of the line, Place Denfert Rochereau, to the Rue Gay-Lussac, where will be located the future terminal station.——A landowner at Hallé, near Auch (Gers) has brought to light a very fine Roman wall constructed of small stones, with an external facing decorated with rich mosaics.——The French Government is about to construct a strategic railway, of narrow gauge, between Cluses and Chamonix, *viâ* Le Fayet (Haute Savoie).——With the advent of the New Year. MM. Valadon and Franck Lamy, painters, and M. Gaudez, sculptor, received the decoration of the Legion of Honour.

MISCELLANEOUS.

THE JUBILEE OF "THE BUILDER."—It may be interesting to note, in connexion with our Jubilee, that the *Builder* has been printed in the same printing-office from the commencement, and that there is still employed weekly in printing the paper a machine-minder who assisted in printing the first number of it.

THE ABERDEEN GRANITE TRADE.—There are sixty firms in the city engaged in the monumental and ornamental branch of the granite trade, employing in all about 2,500 hands. During the year these have been busy executing orders in monumental and architectural work for all parts of the globe. Employers, however, again complain of the smallness of profits, owing to over-competition. The local granite quarries have been unable to supply the demand for stones; and the grey granite quarry at Rogart, Sutherlandshire, has been further opened out by Messrs. A. Macdonald & Co., Limited, of The Aberdeen Granite Works, and a considerable quantity of this granite has been used for monumental and polished building work, house building, railway and bridge work, and girder blocks. Not only so, but during the Harbour Commissioners' financial year (ended 30th September) no fewer than forty-one cargoes of granite stones were imported from the continent—from Sweden, Norway, and Germany—weighing altogether 7,680 tons, 7 cwt., 1 qr. These foreign stones include some colours not obtained in Aberdeenshire granites, and they also polish beautifully; but the experience so far gained has shown that in point of durability of colour they will not compare with home granite, a marked difference being seen in polished tombstones exposed to the sunshine for five or six years. There has been no trade dispute worthy of notice during the year, and the prospects of brisk trade continuing in the stone-polishing and fine stone cutting and dressing departments are encouraging, though the smaller and newer firms, to whose hands the monumental trade for the United States falls, may find orders kept back for a time in the expectation of a modification of the M'Kinley tariff. It may be mentioned that at The Aberdeen Granite Works (Macdonald, Limited), during the year there has been constructed a large and effective polished red granite front, 60 ft. wide by about 30 ft. high, for new buildings in Castle-street, Liverpool, for Messrs. McCorquodale, the well-known railway printers.

STONEWORKING MACHINERY FOR SOUTH AFRICA.—We are informed that Messrs. M. Powis Bale & Co. have secured a considerable contract for stoneworking machinery for South Africa, which is believed to be the first of its kind erected there.

A MANCHESTER BUSINESS.—We have received from Mr. John Heywood, the well-known wholesale newsagent, bookseller, and stationer, of Manchester and London, a *brochure* commemorating the jubilee of the establishment of the house. It gives some interesting details of the growth and progress of one of the largest businesses of the kind in the country, and among the illustrations are portraits of the founder of the business, John Heywood I., of his son, John Heywood II., and of his grandson, John Heywood III., the present head of the business.

THE PLUMBERS' COMPANY.—The Lord Mayor presided at the Quarterly Court of the Plumbers Company at the Guildhall on the 29th ult. A communication from the sub-committee of the Hornsey Divisional Committee of the Middlesex County Council on Technical Instruction was reported, stating that the County Council proposed to arrange for the holding of a class on Plumbers' Work at the Museum of Sanitary Appliances established by the Hornsey Local Board at Highgate, and requesting the Plumbers' Company to nominate a teacher. The Court nominated Mr. Geo. Taylor, R.P.C., foreman to Messrs. Dent & Hellyer, as teacher. The Court also considered a communication from Professor W. R. Smith (director of the Laboratories of State Medicine), on behalf of the Governors of King's College, offering the use of workshops lighted by electricity and the physical and chemical laboratories of the College for advanced technical instruction for plumbers in connexion with the Company's educational scheme. On the motion of Sir Philip Magnus, a committee was appointed to prepare a scheme by which selected students from the Metropolitan Plumbing Schools may have the opportunity of attending a course of advanced instruction at King's College. The Court also considered and approved a syllabus of technical lectures on "Sanitary Plumbing," "Hot and Cold Water Supply," and "House Drainage," to be delivered in connexion with the Victoria University College, Liverpool, where classes for plumbers' apprentices are carried on under the direction of members of the United Operative Plumbers' Association of Great Britain and Ireland.

A. RANSOME & CO., LIMITED.—It is announced that for purposes of simplifying management, Messrs. A. Ransome and Co. and Messrs. Ransome, Josselyn, and Woods have amalgamated their Battersea foundry with their Chelsea engineering works, and converted these two concerns into a private limited company under one name. For many years the two businesses have been owned by the same partners, although their managements have been individual. The new company has been constituted under the Joint Stock Companies' Acts, and has been registered in the name of "A. Ransome & Co., Limited." The late partners, Allen Ransome, Frederic Josselyn, and Vincent Sydney Woods will be the Managing Directors of "A. Ransome & Co., Limited." These gentlemen, we are informed, hold practically the entire share capital of the new company, and the business will be conducted as heretofore.

PARTNERSHIPS.—Messrs. Warner, Walduck & Co., of Gresham House, Old Broad-street, announce that they have admitted into partnership Mr. William Bell and Mr. Frederick George Barrett, both of whom have, for many years, taken an active part in the business.——We are asked to say that the partnership formally existing between Messrs. Keen & Drake, architects, has been dissolved. Mr. Keen retains the offices at 41, Bedford-row.——Mr. William Eve, F.S.I., announces that he has taken into partnership his son, Mr. William Harold Eve, who has been in the office nine years, and that the style or title of the firm will now be "William Eve & Son."

REMOVAL OF OFFICES.—Messrs. Hobbs, Hart, & Co., Limited, as will be seen by announcement in our advertising pages, announce that they have removed their offices to Arlington-street, Islington, N., but that they will continue their show-rooms, &c. at Cheapside.

CHRISTMAS FESTIVITIES AT EXETER.—On Boxing Day Mr. Harry Hems gave his twenty-fourth annual Christmas treat to a number of old and decayed citizens, their wives and widows.

LEGAL.

DISPUTE AS TO A SCOTCH BUILDING "CUSTOM."

AT Paisley, a few days ago, Sheriff Cowan gave decision in an action at the instance of the Building Committee of the Lawn-street Mission Hall against Mr. James Barclay, builder, Christie-street, Paisley, in which (we quote from the *North British Daily Mail*) pursuers sought that defender be ordained to take down the mason work erected by him at the front buildings of the Lawn-street Hall, at present being altered and added to, and to re-erect the same and complete the mason and brick work in

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Lunatic Asylum, Cheddleton	Staffordshire C. C.	200*l.* 150*l.* & 100*l.*	May 1

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Class-rooms, Gymnasium, &c. Normal College, Bangor	Rev. D. Rowlands	R. Davies	Jan. 10
Police Offices, Cells, &c. Kendal	County Police Dept.	S. Shaw	do.
*Sewering, Paving, &c. Works	Bromley Loc. Bd.	*Official*	do.
*Road Works	Lewisham Bd. of Wks.	do.	do.
Railway Material, Cologne	Prussian Royal Rails.	do.	Jan. 11
*Brick Sewer, &c.	Vestry of St. Luke's, Middlesex	do.	do.
*Goods Depot, Minories	G. W. Ry. Co.	do.	do.
*Waiting-room, Mutley Station, Plymouth	.....	do.	do.
*Covering over Platform, Frome	do.	do.	do.
*Two Iron Bridges, near Codford	do.	do.	do.
*One Iron Bridge, near Heytesbury	do.	do.	do.
*Laying Rails, near Redruth	do.	do.	do.
Retaining-wall, Redruth	do.	do.	do.
Restoration of Chapel, Retford	Rev. T. Piggott	.....	do.
Five Houses, Boundary Walls, &c. Ossett	.....	Holtom & Fox	Jan. 12
Welded Iron Pipes, &c. Altona	Prussian Royal Rails.	*Official*	do.
Bar and Angle Iron, Beams, &c. Bromberg	do.	do.	Jan. 13
*120 W.C.s, Basins and Taps	Met. Asylums Board.	do.	do.
*Additions to Water Storage, &c.	do.	do.	do.
*Repairs, &c. at Workhouse	Vestry of St. Luke's Middlesex	do.	do.
*Brick and Pipe Sewers, &c.	Smethwick Local Bd.	Harris & Harris	do.
Sanitary Fittings, and Fixing of same Amblecote	The Corbet Hospital.	T. Robinson	do.
Sewerage Works, Willington Quay	Teignmouth R.S.A.	Mr. Hope	do.
Alterations, &c. to Shops, Rotherham	C. Kenyon	H. L. Tacon	Jan. 14
Four Semi-detached Cottages, Freckleton	Preston Town Council	*Official*	do.
Extension of Asylum, Menstone	West Riding C.C.	J. Vickers Edward	do.
*York Paving	Bermondsey Vestry	*Official*	Jan. 16
Ingot-Steel, &c. Bromberg	Prussian Royal Rails.	do.	Jan. 17
Firebricks, &c.	East Indian Ry. Co.	do.	Jan. 18
*Removal of Pressed Sludge	Chiswick Loc. Bd.	do.	do.
*Jobbing Works	Greenwich Bd. of Wks.	do.	do.
*Underground Urinal	do.	do.	do.
*Removal of House Refuse, &c.	Vestry of St. Pancras	do.	do.
Warehouses and Offices, Stainland, Yorks.	.....	Horsfall & Son	do.
Making-up Road, &c.	Fulham Vestry	W. Sykes	do.

CONTRACTS—*continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Cast-iron, &c. Beillant	French State Rails.	*Official*	Jan. 20
Cast-iron Pipes, &c. (620 tons)	Cookstown (Ireland) Union	.....	Jan. 21
Post-office and Postmasters' Residence, Longford, Ireland	Earl of Longford	J. H. Roynan	do.
*Repairing Ambulance Stations	Met. Asylums Board.	A. & C. Harston	do.
Higher-grade and Technical School, Bristol	The St. George School Board	F. B. Bond	Jan. 23
*Public Offices and Library, Fire Station, &c.	Barking Town L. B.	C. J. Dawson	Jan. 24
*Construction of Sewer	Lewisham Bd. of Wks.	*Official*	do.
*Coast Guard Station, St. Agnes	Admiralty	do.	do.
Goods Store, Belfast	Belfast and Co. Down Rly. Co	do.	do.
*Works and Materials	Wandsworth B. of W.	do.	do.
*Retaining and Boundary Walls	Sheffield U. Gas. Light Co.	F. W. Stevenson	do.
Restoration of Church St. Keverne, Cornwall.	.....	E. Sedding	Jan. 25
*Deep Boring at Waterworks	Horsham Loc. Board	G. Hodgson	Jan. 26
*Brick and Pipe Sewers, &c.	Leicester Corporation	E. G. Mawbey	do.
School Buildings, Masburgh	Rotherham School Bd.	H. L. Tacon	Jan. 31
*Pulling Down and Re-building Windmill	Wimbledon & Putney Commns Conservatrs	*Official*	Feb. 7
*Construction of Underground Urinal	Borough of West Ham	Lewis Angell	Feb. 14
Water-pumping, &c. Apparatus	Osaka (Japan) City C.	*Official*	Feb. 28
*Erection of Schools	Tottenham Sch. Bd.	G. E. T. Laurence	No date
Street Works, Shepherd's Estate, Leeds	.....	Mr. Hobson	do.
Office-buildings, &c, Poole	J. J. Norton	Lawson & Dunkin	do.
Alterations, Business Premises, Burnley	Sacter & Sacter	F. Bell	do.
Restoration of Parish Church, Carlby-by-Stamford	.....	C. Kirk & Sons	do.
Manufacturing Premises	F. Hilton & Co.	Butterworth & Duncan	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
Sanitary Inspector	Greenwich Bd. of W.	125*l.* per annum	Jan. 10
*Quantity Surveyor	St. Leonard's (Shoreditch) Vestry	.....	Jan. 11
Three Divisional Surveyors	Shropshire C. C.	.....	Jan. 14
*Instructors in Woodwork	Sch. Bd. for London.	100*l.* each	Jan. 16
*Two Clerks of the Works	Poplar Union	3*l.* 10s. per week each	do.
*Surveyor and Draughtsman	Eccles Corporation	2*l.* 2s. weekly	Jan. 18
*Surveyor's Assistant	Burnley Corporation	130*l.*	do.
*Manager of Sewerage Works	Teddington Loc. Bd.	.....	Jan. 23

Those marked with an Asterisk (*) are advertised in this number. *Competitions, p.* iv. *Contracts, pp.* iv., vi., viii., x., *and* xii. *Public Appointments, p.* xxxv.

conformity with contract; or to grant warrant to pursuers to have the work done, and deduct the expense from the sum payable under the contract. In his interlocutor the Sheriff finds that there was a condition at the end of the specification to have the facing of the front wall equal to that of the Original Secession Church, the whole stones to be free from soft or wasting and discolouring parts, and laid in the natural bed where practicable, the walls to be built in regular or level courses with throughbond stones in each, not more than 6 ft. apart. He further finds that defender has built the front and back walls, so far as they have yet gone, in disregard of this condition—the stones in both walls, to the extent of from one-third to one-half, being laid, not on the natural bed of the stone, but "on edge" or "on cant"; and with the exception of rybats, scunctions, and sills, that there are no throughbond stones in either wall, and that the facing of the front wall is neither as regards material, workmanship, or symmetrical appearance equal to that of the Original Secession Church. The Sheriff, therefore, ordains defender forthwith to take down and proceed to rebuild the front and back walls, so far as the same fall within the contract, at the sight and to the satisfaction of Mr. T. G. Abercrombie, architect of the building. Meantime, he reserves the question of expenses. In a note the Sheriff says the alleged custom of trade giving to a builder latitude in respect of stones built in "on cant" was sought to be established by the testimony of five builders and one measurer. He considers, however, that while they have shown that a good many builders have succeeded in violating their contracts, the evidence of builders is not alone sufficient to establish a rule of trade as against their employers. The alleged custom he regards as not being proved.

GRINDING MONEY.

AT the Westminster Police Court, on the 22nd ult., three carpenters who had worked at Knightsbridge for Messrs. Higgs & Hill, builders and contractors, of Lambeth, sued the firm, under the Masters and Servants Act, for an hour's wages—namely, 9½d. "grinding money," which they alleged was due to them under the agreed rules of employers and employed governing the building trade. Mr. Maton, solicitor, who appeared for the defendants, said that it was a *bonâ fide* dispute, and it all turned on the construction of one rule which was most ambiguous in its terms. The workmen, who had been engaged on the job for some time, claimed the hour for "grinding money" in addition to an hour's notice. Mr. de Rutzen said that he was of opinion that the real intention of the rule in dispute was to give men situated as the complainants were an hour's grinding money in addition to the hour's notice, to which they were clearly entitled. Judgment, therefore, was in favour of the workmen. Complainants asked for costs. Mr. de Rutzen said he should not give any costs beyond the costs of the summonses, because the rule was open to a great deal of argument.

CAPITAL AND LABOUR.

THE BUILDING TRADES OF LONDON.—The Central Strike Committee of the Operative Bricklayers' Society have just issued a report of their work, of which the *Daily Chronicle* publishes a summary. The Committee was appointed in March 1892 by the Bricklayers' Society to obtain certain advances of wages and reduction of hours for their members. After certain preliminary negotiations with the Master Builders' Association a conference was arranged between all sections of the building trades and the employers. This delay was not pleasing to certain members of the union, and some branches threatened to strike on June 1, but wiser counsels prevailed, and on June 10 last the delegates from the Bricklayers', Masons', Plasterers', Carpenters' Painters', Smiths', Fitters', Navvies' and General Labourers' Unions met the Master Builders' Association. The result was a victory for the men. Here is what the Committee say:—"We asked for a fifty hour week, and we secured it. We asked for a forty-seven hour week in the winter, and we secured it for six weeks, and a forty-four and a half hour week for eight weeks in winter. We asked for an advance of a 1d. per hour, and we secured ½d. advance, labourers included, although they were only offered ¼d. per hour advance. We asked as extra pay for overtime, time and a half from leaving-off time until eight o'clock, and double time after eight, and we secured time and a quarter from leaving-off time until eight o'clock, time and a half from eight till ten, and double time after ten. We asked for double time for time worked after twelve noon on Saturdays, and we secured time and a half from twelve until four p.m., and then double time after four. We asked that an hour's notice should be given, or one hour's time paid, for payment on the job or walking time; that a suitable place be built for shelter and for workmen to take their meals, with a labourer to assist in preparing them; travelling expenses when sent over six miles from yard or job; and the London district defined and extended to a twelve-mile radius from Charing Cross." An agreement was drawn up which, with one or two small exceptions, has been acted upon throughout the London district. The total cost of the whole movement, including strike pay, picket pay, printing, postage, salaries, and travelling expenses, amounts to £372 18s. 11d., or an average of 1s. 3d. per member for the London district. The advance in wages to the London bricklayers alone means £28,116 per annum, besides that which has been obtained by the other trades—a pretty fair test of the value of federated trade unionism.

MEETINGS.

SATURDAY, JANUARY 7.

Sanitary Inspectors' Association.—The President (Dr. B. W. Richardson) will deliver a New Year's address. 6.30 p.m.

SUNDAY, JANUARY 8.

Sunday Lecture Society.—Mr. Whitworth Wallis on "Ancient Egypt: its Temples, Pyramids, Monuments and Mummies." 4 p.m.

MONDAY, JANUARY 9.

Royal Institute of British Architects.—(1) Award of Prizes and Studentships; (2) "Notes of Tours made during the last two years in Spain and the Island of Majorca," by Mr. Andrew N. Prentice. 8 p.m.

Surveyors' Institution.—(1) Paper by Mr. P. D. Tuckett entitled "A Short Explanation of the Proposed Bimetallism as affecting British Interests"; (2) Mr. A. Goddard on "The Currency Question and Land." 8 p.m.

Clerks of Works' Association (Carpenters' Hall).—Monthly Meeting. 8 p.m.

Liverpool Architectural Society.—Fourth Ordinary Meeting. 6.30 p.m.

TUESDAY, JANUARY 10.

Institution of Civil Engineers.—Mr. J. Emerson Dawson on "Gas-Power for Electric Lighting." 8 p.m.

Society of Biblical Archæology.—8 p.m.

Glasgow Architectural Association.—Mr. E. A. Sutherland on "Association Studentship Work." 8 p.m.

WEDNESDAY, JANUARY 11.

Edinburgh Architectural Association.—Professor Baldwin Brown, M.A., on "Bronze Doors, including those of Southern Italy." 8 p.m.

THURSDAY, JANUARY 12.

Institution of Electrical Engineers.—Discussion of Mr. J. A. Fleming's paper on "Alternate Current Transformers." 8 p.m.

Society of Antiquaries.—8.30 p.m.

FRIDAY, JANUARY 13.

Architectural Association.—Mr. R. Phené Spiers on "The Influence of Byzantine Art in Italy from the Sixth to the Twelfth Century." 7.30 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. E. Hulme on "The Design and Construction of a Road-way Bridge over the River Cam." 7.30 p.m.

Society of Arts (Howard Lectures).—Professor W. C. Unwin on "The Development and Transmission of Power from Central Stations." 8 p.m.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

22,809.—PAINTS: *M. Williams.*—The object of this invention is to obtain superior stiff oil paint or putty by using a less costly medium than ordinary linseed, or other seed oil, and which can be "thinned," or made ready for use, by this means or by ordinary "thinners." Such medium can also be used for varnishes and enamels. It consists in grinding ordinary colours and pigments in an oil or medium prepared from rosin or resin by distillation, and termed rosin or colophony oil, sweetened and fixed with hot or cold air and steam, and which can be, if desired, a pale colour, redistilled and bleached by the ordinary methods. The oil thus obtained is treated or boiled with any suitable dryers to make it more siccative. It can then be used alone as an oil medium for grinding the pigments into paints by roller or other mills, or a proportion of boiled or raw linseed, or other seed oils, or boiled or raw oil foots, or varnish foots, or varnish gums, can be previously incorporated or used conjointly with it.

827.—GIRDERS: *W. Orr.*—This invention relates to metallic girders, and has for its object to provide a girder light in structure, easily erected, and whose component parts can be packed together into small compass for transport. The girder is composed of two iron or steel tubes of round, oval, rectangular or other cross section, one of which constitutes the top, and the other the bottom members. The tubes may be close or butt-jointed, or welded, and between them a webb, or midrib, extends, the said webb being composed of a number of sections, each having a jaw or recess at its upper and lower part, shaped to the contour

of the tubes, and into which the tubes are entered, whilst at its ends each section of the webb is rebatted, morticed, and tenoned, raggled, serrated, or waved correspondingly with the next section, so as to give the various sections a hold of each other. The sections of the midrib are pushed into place one after the other from one end of the girder, and the whole structure is bound together by end plates, or flanges, having holes in them at distances apart corresponding to the depth of the girder, these holes receiving the ends of the tubes, or solid plugs screwed into the said ends. The end plates are wedged or screwed hard up, causing all the sections of the mid-web or rib to bear against each other endwise and constitute at the same time a light, but very rigid structure.

2,166.—ROOFS: *S. A. Cheale.*—The principal object of this invention is to provide for the automatic free admission of air and moisture to vines, fruit trees, and other trees, shrubs, &c., growing under glass, in such manner that the free circulation of air is effected without injurious draughts, and the growth of mildew rendered impossible. The invention is also applicable to other structures, as offices in railway stations, and stands and stalls in other large buildings, the roofing material in such cases not necessarily being made of glass or other transparent material. This improved glass roof is constructed in the following manner:—At the sides of each vertically running row of glass sheets a narrow lateral space, say about a quarter of an inch wide, is left open, and between the top of each glass sheet and the bottom of the next higher glass sheet narrow height spaces are left open. The said lateral spaces between the sheets of glass, or other roofing material, are suitably produced by making the clear space between the rafters slightly wider than the width of the glass sheets, and by supporting the glass sheets on narrow strips, or fillets, of wood fixed to the sides of the rafters, with a narrow space, inch wide, between fillet and rafters. The height spaces are formed by giving the fillets a sufficiently greater rise, or angle, than the rafters.

6,511.—VENTILATORS: *W. Morrison.*—This invention relates to a circular circulating air chamber with circular escapement holes in the bottom flange for allowing the obnoxious vapours to pass freely away. There are also eight vertical conical flues attached to the circulating air chambers for conveying vapours into air chambers. In the interior of the ventilator are employed two suspended circular whirlwind fans, connected by rods to a cone at the bottom of an outside fan driven by atmospheric pressure, and arranged with canvas fluttering wind-sails revolving between and around a vertical lubricating tube, which takes the form of an upright shaft, causing a quick up-current, making down draught impossible. The fan appliances also consist of a hanger frame bent at the top ends, so arranged as to hang in two clips and two guides, with screwed bolts and nuts passing through clips, keeping the hanger frame in one position, showing the advantage of being able, if required, to take out the inside fan appliance of ventilator. The portable hanger frame has a large boss in the centre with box nut for tightening the fan spindle tube to the hanger frame, which extends from top of the uptake and bottom portion.

13,240.—VARNISH: *H. Pfaune.*—This invention consists in a method for the production of varnish from linseed oil by means of an electric current, and an apparatus for carrying the same into effect. The varnish is almost colourless, and perfectly free from all mineral or metallic admixtures. The linseed oil, which has been purified in the proper manner, is thoroughly mixed and agitated with sulphuric acid and water, and subjected for about two to three hours to the passage and action of an electric current, so that the oxygen produced in the nascent state by the passage of the current converts the oil into varnish. The apparatus is fully illustrated in the drawings annexed to the specification.

14,155.—SASH BALANCE: *B. H. Rose.*—This improvement relates to spring-balances for holding sashes, and consists in the combination of a case provided with two side plates, a spring-drum turning on a rivet between the side plates, a loose rim or cover encircling the spring-drum, and a spring placed between one of the side plates and the cover, whereby the latter is forced against the drum to produce brake-action.

[Owing to the failure of the Patent Office to issue the usual weekly official journal last week, we are unable to supply the "New Applications," &c., but will incorporate them in our list next week.]

PRICES CURRENT OF MATERIALS.

TIMBLR.		
Greenheart, B.G.	ton	9/0/0 0/0/0
Teak, E.I.	load	9/10/0 15/0/0
Sequoia, U.S.ft.cu.		2/4 3/0
Ash, Canada	load	2/10/0 4/0/0
Birch, do.		3/5/0 4/10/0
Elm, do.		3/10/0 4/15/0
Fir, Dantsic, &c.		1/10/0 3/10/0
Oak, do.		3/0/0 5/5/0
Canada		5/10/0 7/0/0
Pine, Canada red		2/10/0 3/10/0
Do. Yellow		2/10/0 5/0/0
Lath, D'ntsic, fath		5/0/0 6/0/0
St. Petersburg		5/0/0 7/0/0
Deals, Finland 2nd & 1st std	100	7/10/0 10/0/0
Do. 4th & 3rd		7/10/0 8/0/0
Do. Riga		6/10/0 8/0/0
St. Petersburg, 1st yellow		10/10/0 14/10/0
Do. 2nd yellow		8/10/0 9/10/0
Do. white		7/10/0 9/10/0
Swedish		7/10/0 16/0/0
White Sea		8/10/0 17/0/0
Canada, Pine 1st		21/0/0 27/10/0
Do. do. 2nd		15/0/0 17/0/0
Do. do. 3rd &c.		7/10/0 10/0/0
Do. Spruce, 1st		8/10/0 11/0/0
Do. do. 3rd & 2nd		6/10/0 8/0/0
New Brunswick		6/10/0 7/10/0
Battens, all kinds		3/10/0 15/10/0
Flooring boards, sq., 1 in. prep. 1st		0/8/0 0/14/0
Do. 2nd		0/7/0 0/10/0
Other qualities—		0/3/6 0/7/6
Cedar, Cuba	ft.	3/4 /4½
Honduras, &c		3/4 /4½
Mahogany, Cuba		4/4 /6½
St. Domingo, cargo av.		/4 2/0
Mexican do. do.		/4 /5
Tobasco do. do.		/4½ /7
Honduras do.		/5 /6½
Box, Turkey	ton	4/0/0 13/0/0
Rose, Rio		10/0/0 20/0/0
Bahia		9/0/0 18/0/0
Satin, St. Domingo	ft.	0/0/6 0/1/3
Porto Rico		0/0/7 0/1/6

TIMBER (*continued*).		
Walnut, Italian		0/0/3½ 0/0/7
METALS.		
Iron—Pig, in Scotland	ton	2/1/7½ 0/0/0
Bar, Welsh, in London		5/17/6 6/0/0
Do. do. at works in Wales		5/7/6 5/10/0
Do. Staffordshire, in London		6/5/0 6/15/0
COPPER—British, cake and ingot		50/0/0 50/10/0
Best selected		51/10/0 52/0/0
Sheets, strong		60/0/0 0/0/0
Chili, bars		46/12/6 47/0/0
YELLOW METAL	lb	0/0/5½ 0/0/5⅝
LEAD—Pig, Spanish	ton	9/17/6 10/0/0
English com. brands		10/0/0 10/2/6
Sheet, English, 6 lbs. per sq. ft. and upwards		11/5/6 0/0/0
Pipe		11/15/0 0/0/0
ZINC—English sheet	ton	22/10/0 0/0/0
Vieille Montagne		23/0/0 0/0/0
TIN—Straits		91/5/0 91/15/0
Australian		92/0/0 92/10/0
English Ingots		95/0/0 95/10/0
Banca		92/10/0 93/0/0
Billiton		92/0/0 92/10/0
OILS.		
Linseed	ton	18/15/0 19/0/0
Cocoanut, Cochin		25/10/0 0/0/0
Do. Ceylon		23/10/0 0/0/0
Palm, Lagos		26/0/0 0/0/0
Rapeseed, English pale		24/10/0 24/15/0
Do. brown		23/0/0 23/5/0
Cottonseed ref.		19/10/0 0/0/0
Oleine		20/10/0 21/0/0
Lubricating, U.S.		4/0/0 5/0/0
Do. refined		5/10/0 12/0/0
TAR—Stockholm	barrel	0/17/6 0/18/6
Archangel		0/12/6 0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 12 noon on Thursdays.*]

BRADFORD (YORKS).—For the erection of stabling, Manningham, Bradford. Mr. James Young, architect, 62, Market-street, Bradford:—

Wm. Small	£306 0 0	Wilkinson & Dawson	£250 0 0
Wm. Johnson	312 13 0	Rhodes, Bros.	244 19 0
Wright North	274 0 0	Davies & Jones	296 12 9
Walter Barrand	270 0 0		

BRIGHTON.—Accepted for the warming and ventilation of Board Schools, Brighton:—

Hollond-road School—		*Elm Grove School*—	
John Grundy, London	£218	John Grundy, London	£190

BRISTOL.—For building St. Bartholomew's Church, Montpelier Park, Bristol. Messrs. W. & C. A. Bassett Smith, architects, 10r John-street, Adelphi, W.C.:—

J. E. Davis	£6,045 0	W. Church	£5,456 0
Eastabrook & Sons	6,000 0	W. Brock & Son	5,220 0
J. Perkins	5,998 0	A. J. Beaven	5,175 0
W. Cowlin & Son	5,780 0	R. Wilkins & Sons	5,016 0
G. H. Humphreys	5,771 0	G. H. Wilkins*	5,011 10
E. T. Hatherly	5,681 0	* Accepted.	
Stephens & Bastow	5,647	[All of Bristol.]	

BUSHEY HEATH (Herts).—Accepted for the "Noakes Memorial Pulpit" in Bushey Heath Church. Mr. James Neale, architect, 10, Bloomsbury-square, London:—

J. Norris & Sons, Sunningdale £139 0 0
[The carving and sculpture by Mr. D. N. Smith, of Battersea.]

CHUDLEIGH KNIGHTON (Devon).—For the erection of a cottage, and conversion of a building into two cottages, for Mr. H. Hamlyn. Mr. Samuel Segar, architect, Union-street, Newton Abbott, Devon. Quantities by the architect:—

J. Widdicombe	£590 10	S. H. Davie	£500 0
R. Collings	560 0	J. Pomroy, Ashburton*	410 13
		* Accepted.	

HALIFAX.—Accepted for the erection of new infirmary buildings for the Building Committee of the Halifax Infirmary. Messrs. Worthington & Elgood, architects, 46, Brown-street, Manchester. Quantities by Mr. Charles Jackson, Manchester:—

Masonry—Wm. Sutcliffe, Sowerby Bridge	£22,000 0 0
Carpentry & Joinery—S. Wadsworth & Son, Halifax	7,200 0 0
Slating & Plastering—Rushworth & Firth, Halifax	3,237 0 0
Ironwork—John Berry, Halifax	1,067 0 0
Plumbing & Glazing—J. Naylor & Son, Halifax	1,300 0 0
Concreting—G. Greenwood & Sons, Halifax	1,834 7 0
Painting—J. Binns & Sons, Halifax	980 0 0
Total of accepted Tenders	£37,618 7 0

HALLIFORD (Middlesex).—Accepted for alterations, repairs, and drainage works at Halliford, under the superintendence of Mr. James Neale, architect, 10, Bloomsbury-square, London. No quantities:—

Norris, Sunningdale £1,589 13 3
[Stable fittings by Barton, Oxford-street.]

HEBDEN BRIDGE.—Accepted for the construction of a storage reservoir and filter beds at Hollin Hall (3 contracts) for the Local Board. Mr. Wilson Calvert, Surveyor, Local Board Offices, Market-street, Hebden Bridge:—

Mason and Concrete Work.

Riley Hopkinson	£2,808 16 3	Waddington Bros. & Holmes	£2,203 14 2
R. Walker	2,660 0 0	William Sutcliffe	2,121 8 7
T. Lant & Co.	2,526 8 6	Matthew Hall & Sons	2,049 13 7
Oldfield Watson	2,500 0 0	James Ashworth	1,980 9 0
Parkinson & Bower	2,440 10 0	C. O. Bullough & Co.	1,876 5 0
C. Braddock	2,411 6 5	Arthur Bland	1,811 19 4
Emmanuel Kellet	2,400 0 0	Benjamin Lumb, Todmorden*	1,750 0 0
Brown & Phillips	2,319 17 9	Etheridge & Clark	1,718 5 0
Emmanuel Riley	2,297 3 0	* Accepted.	

Waterpipes.

Macfarlane, Strang, & Co., Ltd. *	£259 6 0	Stanton Iron Works Co.	£234 18 10
John Walker	240 11 1	James Oakes & Co.	224 17 6
Hartley & Crabtree	240 7 0	Clapham Bros., Keighley*	218 1 6
Wm. Sutcliffe	240 0 0	Etheridge & Clark	215 13 5
E. W. & H. Haley	235 10 2	* Accepted.	

Valves and Covers.

Wm. Sutcliffe	£74 8 0	Etheridge & Clark	£47 2 0
Clapham Bros.	59 3 0	Glenfield Co., Ltd	46 16 0
Macfarlane, Strang, & Co.	54 17 0	J. Blakeborough & Sons, Brighouse*	44 14 3
Guest & Chrimes	52 7 6	Hamilton, Woods, & Co	42 19 0
		* Accepted.	

KNIGHTON (I. W.).—For making a boring into the Lower Greensand beds, for the Ryde Town Council. Mr. Francis Newman, Borough Engineer, Ryde, I. W.:—

		Tube per ft. 11 in.	9½ in.	8½ in.
	£ s. d.	s. d.	s. d.	s. d.
Wm. Brown	1,220 0 0	18 0 ..	14 0 ..	11 0
Exors. late E. Timmins	1,200 0 0	30 0 ..	28 6 ..	24 9
T. Parsons	960 5 0	20 0 ..	— ..	—
W. Hill & Co.	960 0 0	17 6 ..	14 0 ..	11 6
Edwd. Margrett	950 0 0	20 0 ..	16 0 ..	14 0
Duke & Ockenden	828 10 0	15 3 ..	11 6 ..	8 6
R. D. Batchelor	635 19 4	15 9 ..	13 9 ..	12 6
T. Tilley & Sons	595 0 0	13 0 ..	11 0 ..	7 3
Isler & Co.*	550 0 0	16 0 ..	14 0 ..	10 6
John Thom, Patricroft†	550 0 0	17 0 ..	10 6 ..	7 0

* Tender on the assumption that all tubes used should be paid for; other tenders, tubes lapping beyond 3 ft., not paid for.
† Accepted.

LONDON.—Accepted for re-casting stables, Eastbourne-mews, Westbourne-terrace, for Mr. Leonard Wakefield. Mr. James Neale, architect, 10, Bloomsbury-square, London:—

J. Norris & Sons, Sunningdale £223 4 5

LONDON.—Accepted for new stables, Mount Vernon, Hampstead. Mr. James Neale, architect, 10, Bloomsbury-square, London:—

J. Norris & Sons, Sunningdale £534 12 0
[Stable fittings by Barton, Oxford-street.]

LONDON.—Accepted for the erection of a residence, "Compton Leigh," Frognal-gardens, Hampstead. Mr. James Neale, architect, 10, Bloomsbury-square, London. No quantities:—

J. Norris & Sons, Sunningdale £3,347 0 0
[Exclusive of kitchen ranges, stoves, and decoration.]

LONDON.—Accepted for completion of woodwork of residence for Mr. Walter Besant; also mantelpieces and joinery work, at No. 12, Frognal-gardens, Hampstead. Mr. James Neale, architect, 10, Bloomsbury-square:—

J. Norris & Sons, Sunningdale £438 0 0

LONDON.—Accepted for new drains, ventilating shaft, and intercepting chamber at 10, Bloomsbury-square, under the superintendence of Mr. James Neale, F.S.A., architect:—

J. Norris & Sons, Sunningdale £114 16 0

LONDON.—Accepted for alterations, repairs, and decorations to 40, Westbourne-terrace, Hyde Park, for Mr. Leonard C. Wakefield. Mr. James Neale, architect, 10, Bloomsbury-square, W.C.:—

J. Norris & Sons, Sunningdale, Ascot £1,809 8 0
[No competition. No quantities.]

LONDON.—Accepted for works at Austin Friars, City, E.C., for Messrs. Sperling & Co. Mr. James Neale, architect, 10, Bloomsbury-square, London. No quantities:—

W. Fletcher, Cadogan-street, S.W. £301 13 1

LONDON.—For channelling and paving works, 3,289 ft. kerbing, 7,104 ft. channelling, 274 yards super. paved crossings, for the Lewisham Board of Works. Mr. John Carline, Surveyor, Board of Works Offices, Catford, S.E.:—

Mowlem & Co., Westminster (accepted at a schedule of prices).

LONDON.—Accepted for the construction of 10,000 ft. run of stoneware pipe drains, Penge, for the Lewisham Board of Works. Mr. John Carline, Surveyor, Board of Works Offices, Catford, S.E.:—

William Woodham, Lower Sydenham £2,732 0 0

LONDON.—For the extension of workmen's dwellings (exclusive of excavation and foundations) on the north side of Flower and Dean-street, Spitalfields. Messrs. N. S. Joseph & Smithem, architects, 45, Finsbury-pavement:—

Mark Patrick & Son	£4,587	Laurance & Sons (accepted)	£4,231
Patman & Fotheringham	4,550		

LONDON.—For building new premises in Sloane-square, Chelsea, for Mr. D. H. Davies. Mr. F. G. Knight, architect, 6, Great College-street, Westminster. Quantities by Mr. Frederick R. Smith, 6, Great College-street:—

Shepherd	£13,260	Colls & Son	£12,330
Lathey Bros.	12,718	B. E. Nightingale*	11,838
Bywaters	12,560	Chas. Wall	11,550
Stimpson	12,400	*Accepted	

LONDON.—For alterations, &c., to "The Prince of Wales" beer-house, Brixton. Mr. W. G. Ingram, 44, Theobald's-road, W.C.:—

White & Co.	£325	Knight	£277
B. E. Nightingale	325	Mid Kent Building Co.	276
Rowe	300	Puttick	275

LONDON.—For pulling-down and re-building "The Tower" public house, No. 76, Westminster Bridge-road, for the New City of London Brewery Co., Ltd.:—

Hoare & Son	£6,842	B. E. Nightingale	£6,192
Patman & Fotheringham	6,350	Smith & Sons	6,147
Greenwood	6,248	Leek & Hooker	6,100
H. L. Holloway	6,233		

LONDON.—For alterations and additions to No. 17, Pall Mall East, for the Imperial Live Stock Association, 48, Pall Mall, S.W.:—

W. H. Clark	£2,824 0	Lascelles	£2,326 0
C. Wall	2,812 0	F. J. Brierly	2,314 0
Rosenburg	2,705 15	J. Binks	2,300 0
B. E. Nightingale	2,538 0	Scrivener	2,139 0
Lilly & Lilly	2,349 0		

LONDON.—For alterations and repairs at 118, Holborn, for Mr. A. W. Gamage:—

William Reason, Clerkenwell (accepted) £1,145 0 0

LONDON.—For building new business premises, including stables and bacon-stoves, at Smithfield Market, for Messrs. Pratt & Sons. Mr. Lewis Solomon, architect, 55, New Broad-street, E.C.:—

Allen & Allen ..... £3,530 | William Reason, Clerkenwell* £3,513
* Accepted.

LONDON.—Accepted for alterations and repairs to No. 22, Martin's-lane, Cannon-street, City. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, E.C.

T. Osborn & Sons, Lower Thames-street, E.C. £400 0 0

LONDON.—For repairs and part rebuilding stabling, Mare-street Hackney. Mr. Harrison, architect:—

Marshall	£120	W. Lawson, 228, Kingsland-road*	£101
White	104		

*Accepted.

LONDON.—For the erection and completion of new business premises, George-street, Manchester-square, W., for Messrs. A. Emanuel & Sons, Limited. Mr. George Drew, architect. Quantities by Mr. William Eversden, 27, Southampton Buildings, Chancery-lane, W.C.

R. A. Yerbury	£18,100	Higgs & Hill	£17,284
Messrs. Bywaters & Co.	17,450	Clarke & Bracey	16,556
John Mowlem & Co.	17,369	B. E. Nightingale	16,195
F. & H. F. Higgs	17,320	H. Oldrey	15,450

OXENDON (Northants).—Accepted for alterations and additions at Oxendon. Mr. James Neale, architect, 10, Bloomsbury-square, W.C.:—

Smith & Co., London £3,586 4 0
[No quantities. Stable fittings by Barton, Oxford-street.]

RHAYADER (Radnor).—For the erection of a dwelling-house and shop, East-street, Rhayader, for Miss Lloyd. Mr. Stephen W. Williams, architect, Rhayader. Quantities by the architect:—

John D. Williams	£1,324	W. P. Lewis & Co.	£1,100
H. Welsh	1,219	Thomas Price, Hay*	1,080
Richard Price	1,150	*Accepted.	

ROCHESTER.—Accepted for warming the Troy Town Board School, Rochester:—
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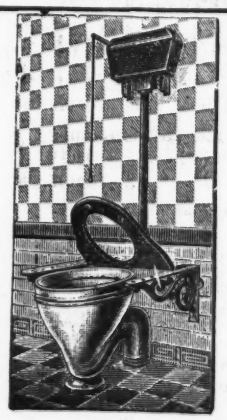

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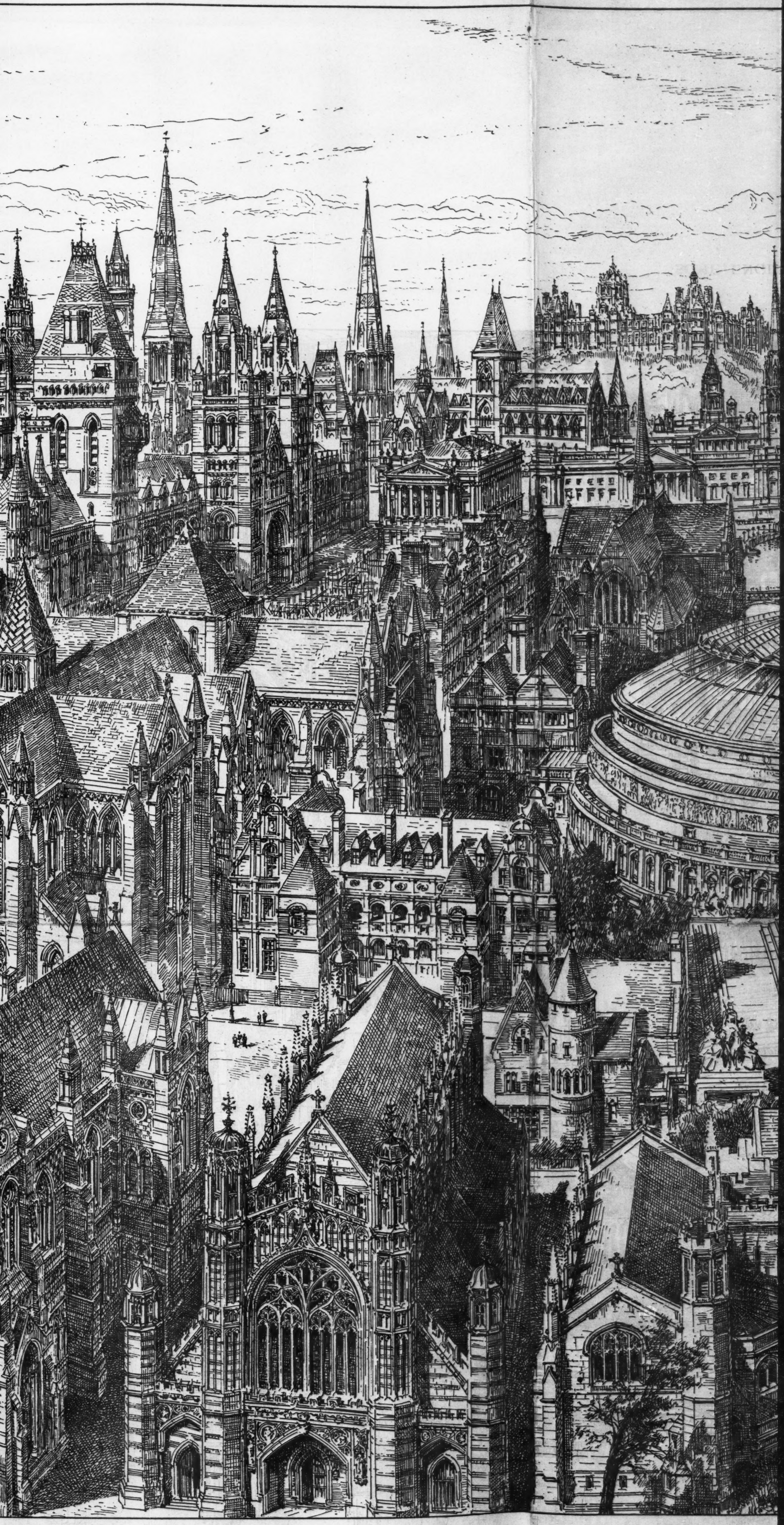

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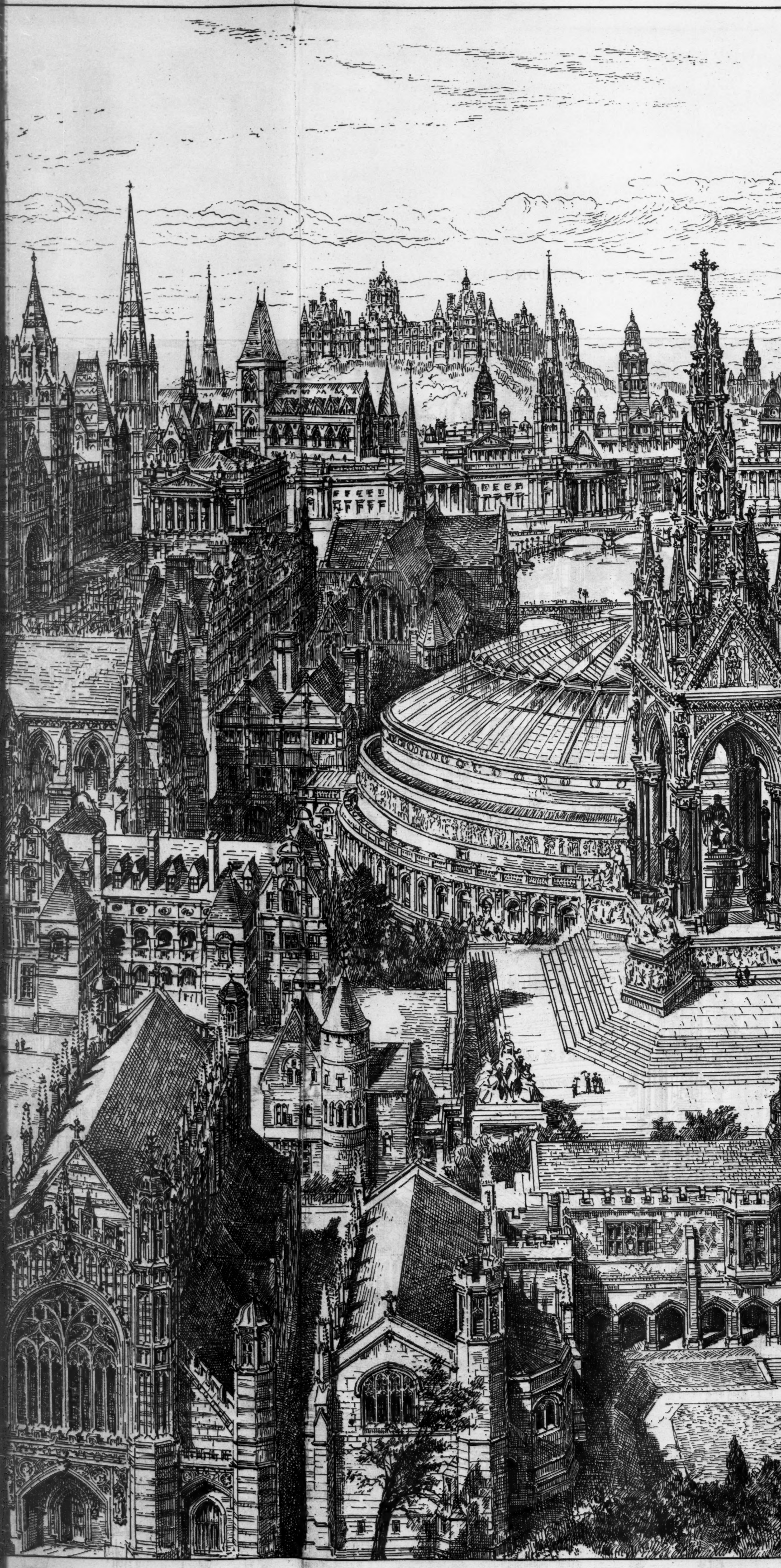

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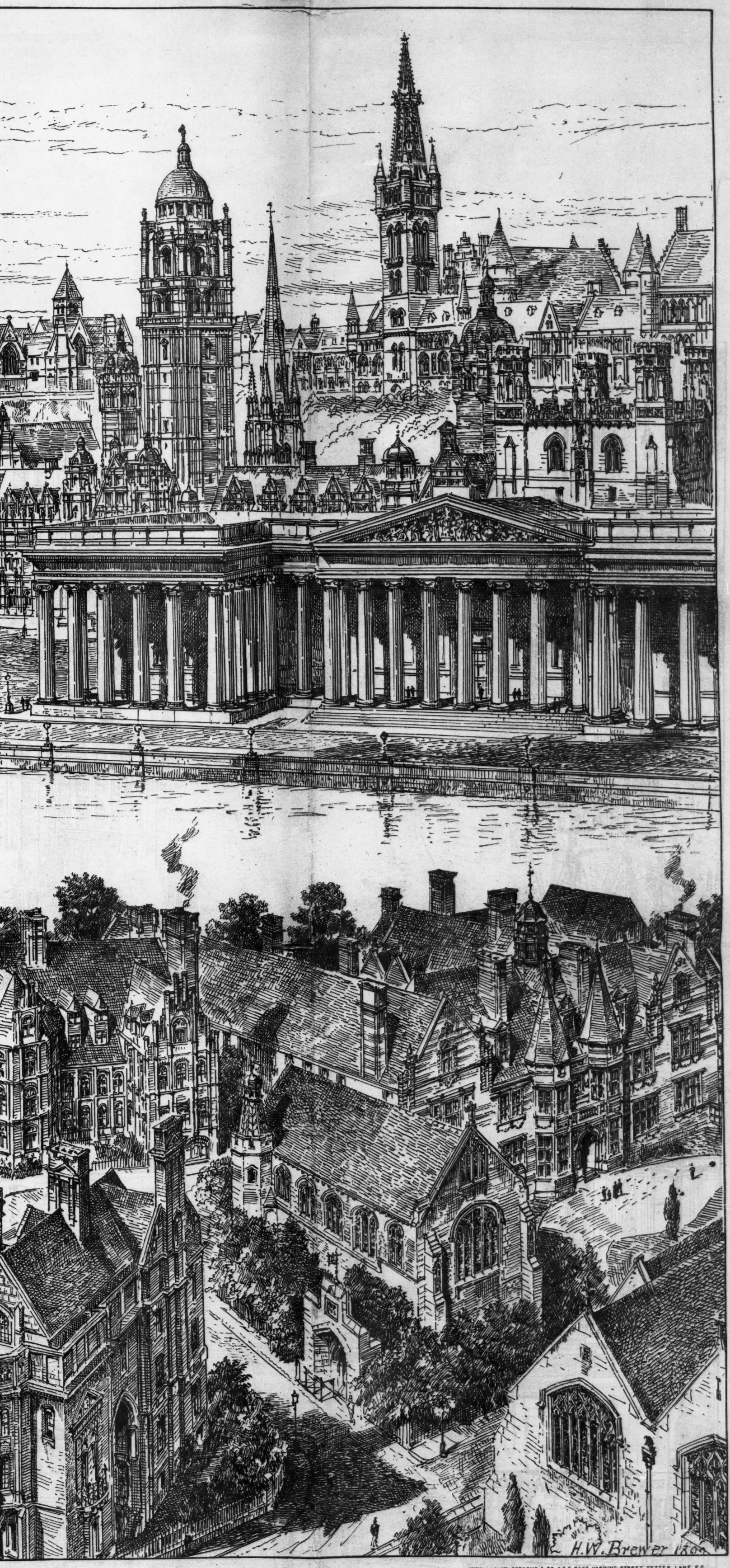

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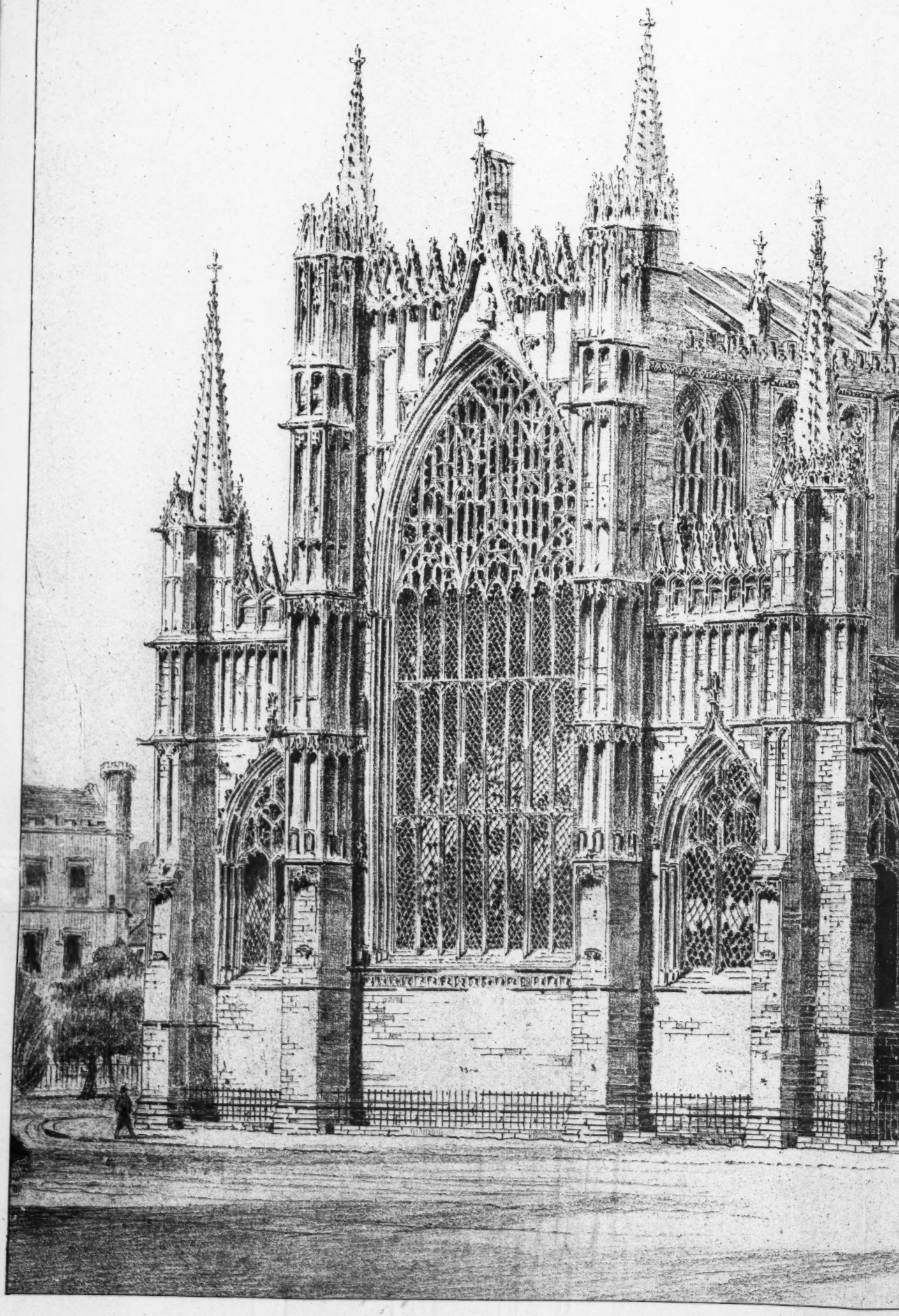

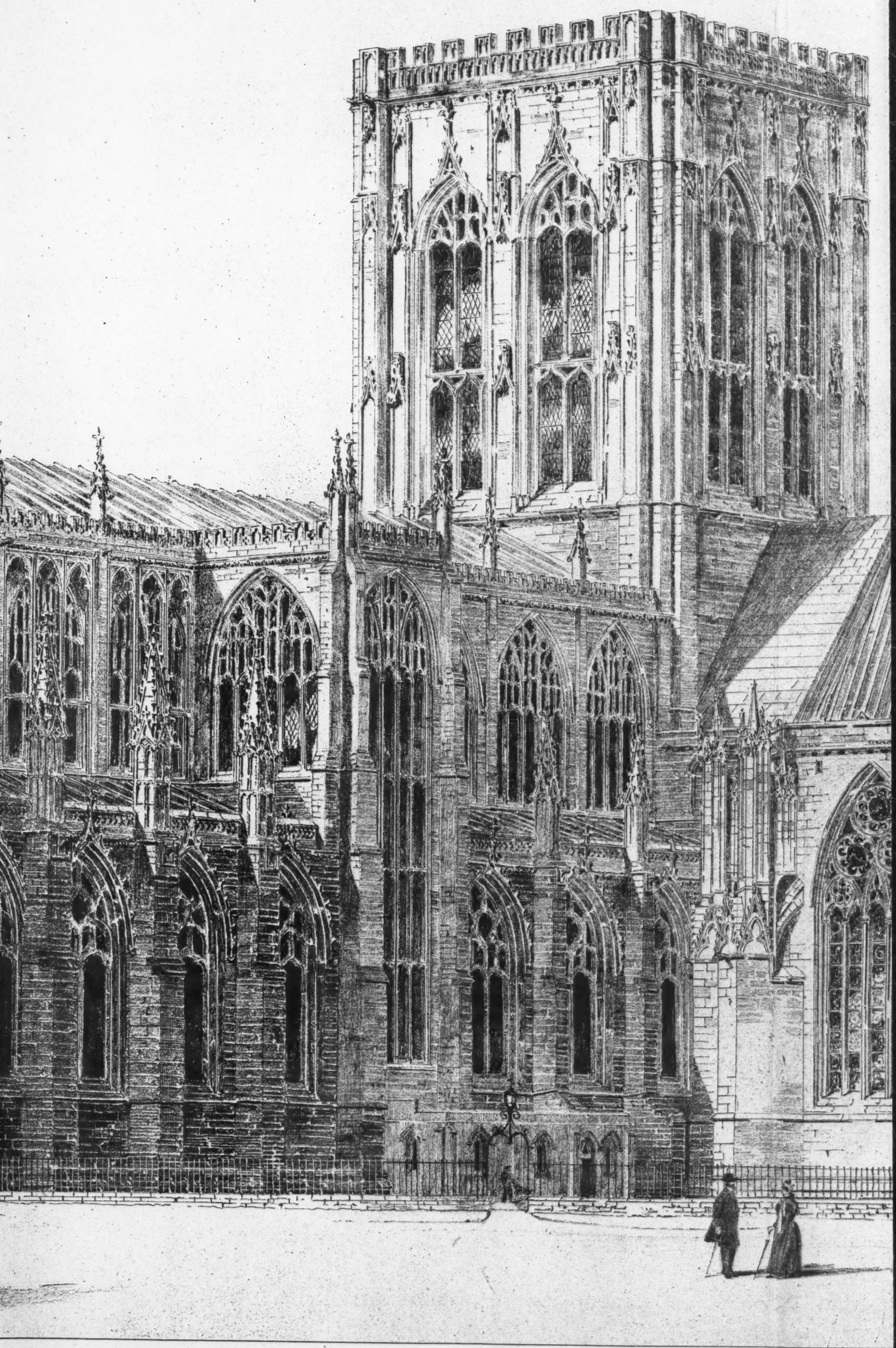

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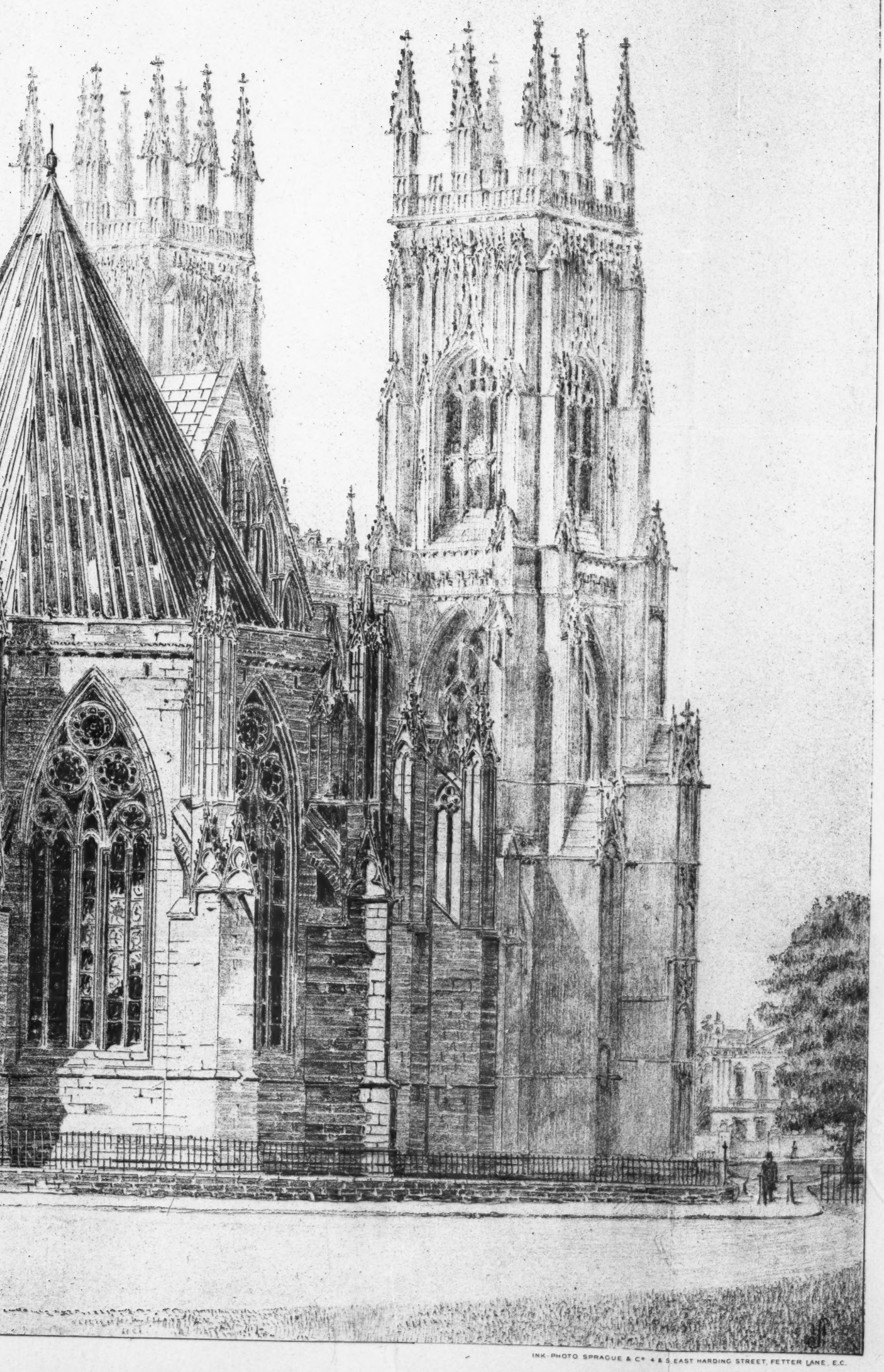

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Grovnd Plan.

10 5 0 10 20 30 40 50
Scale.

Foundations supposed to be those of the Chapel of the Blessed Virgin, built by Archbishop Roger & finished by Archbishop Thoresby.
(enlarged from plan in History of York Minster by John Browne p. 181.)

N. W. TOWER

S. W. TOWER

Norman Church.

West wall of the N A V E

(P

Reference.

- Norman.
- Early English
- Decorated
- 1st Perpendicular
- 2nd do
- 3rd do
- 4th do
- Modern.

R.

100 Feet.

VESTIBULE

11

10

NORTH TRANSEPT

9

12

Modern.

8

LANTERN

Rood

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18

Will Office.

SOUTH TRANSEPT

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14

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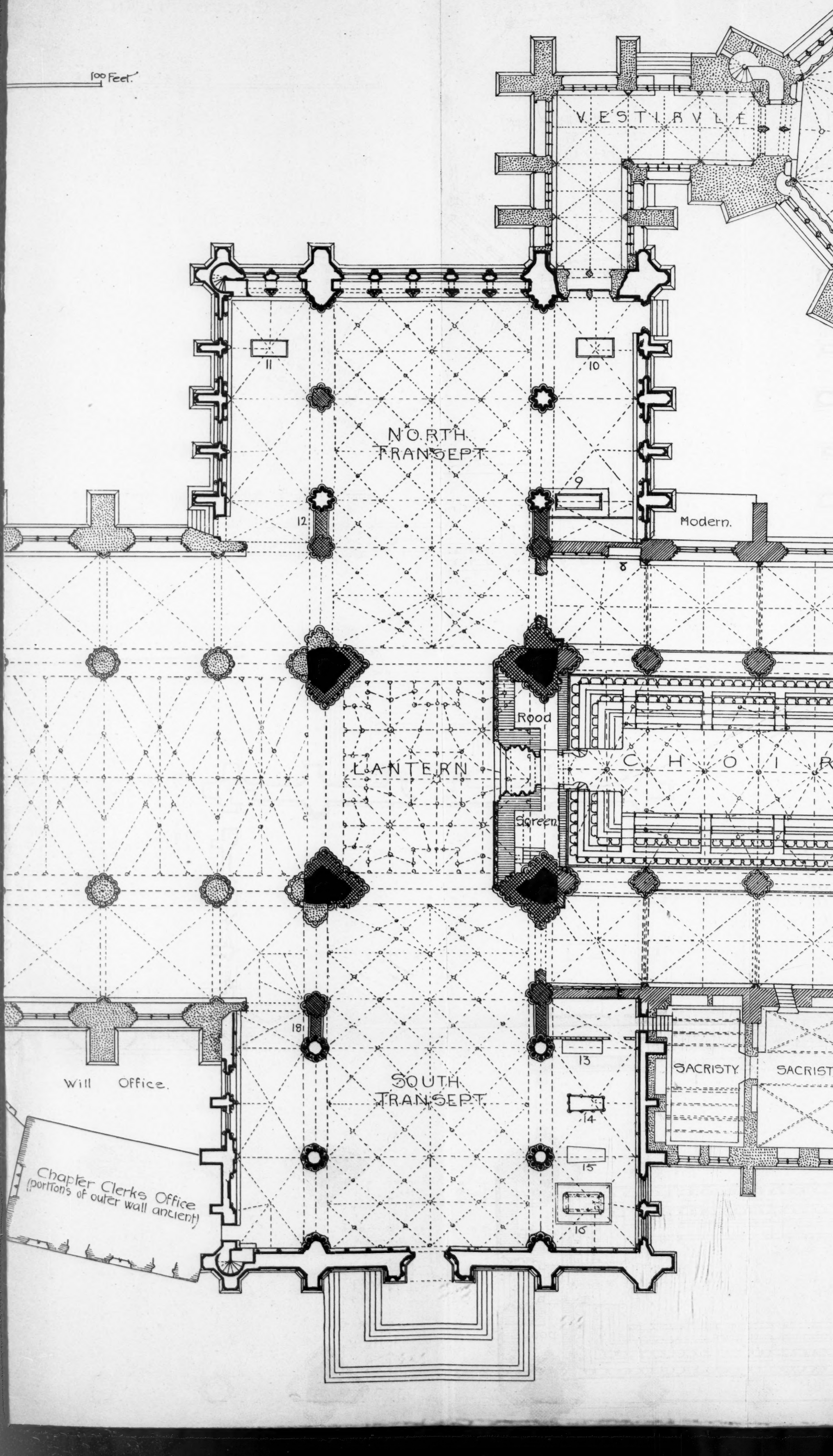
16

Chapter Clerks Office
(portions of outer wall ancient)

E R.


100 Feet.
VESTIBULE
NORTH TRANSEPT
11
10
9
12
Modern.
8
LANTERN
Rood
Screen
CHOIR
18
13
14
15
16
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Will Office.
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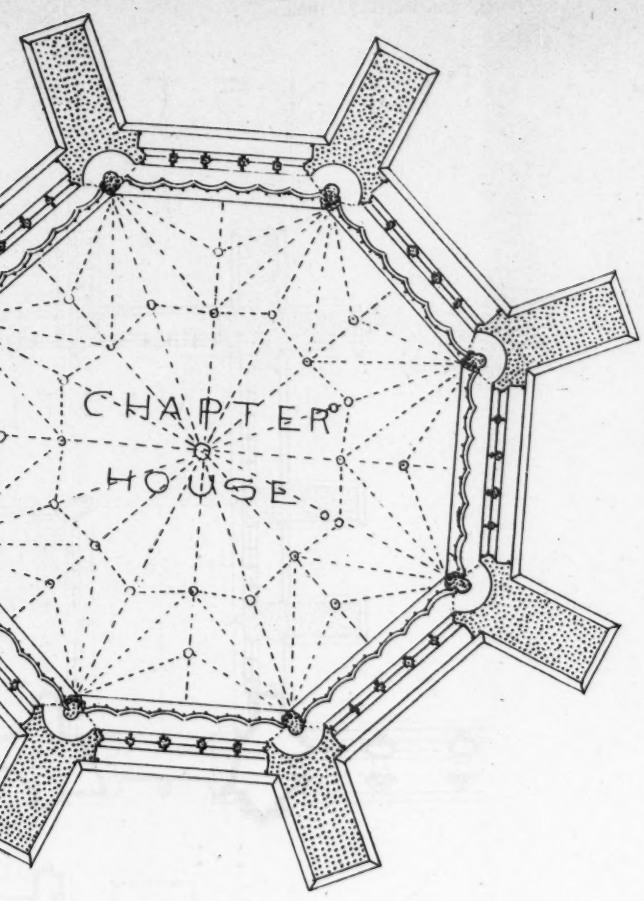

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2. " Scrope.
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4. " Musgrave.
5. " Bowet.
6. " Matthew.
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8. William of Hatfield.
9. Archbishop Greenfield.
10. Dr. Stephen Beckwith
11. Archbishop Harcourt.
12. Cadaver - Haxeys Tomb.
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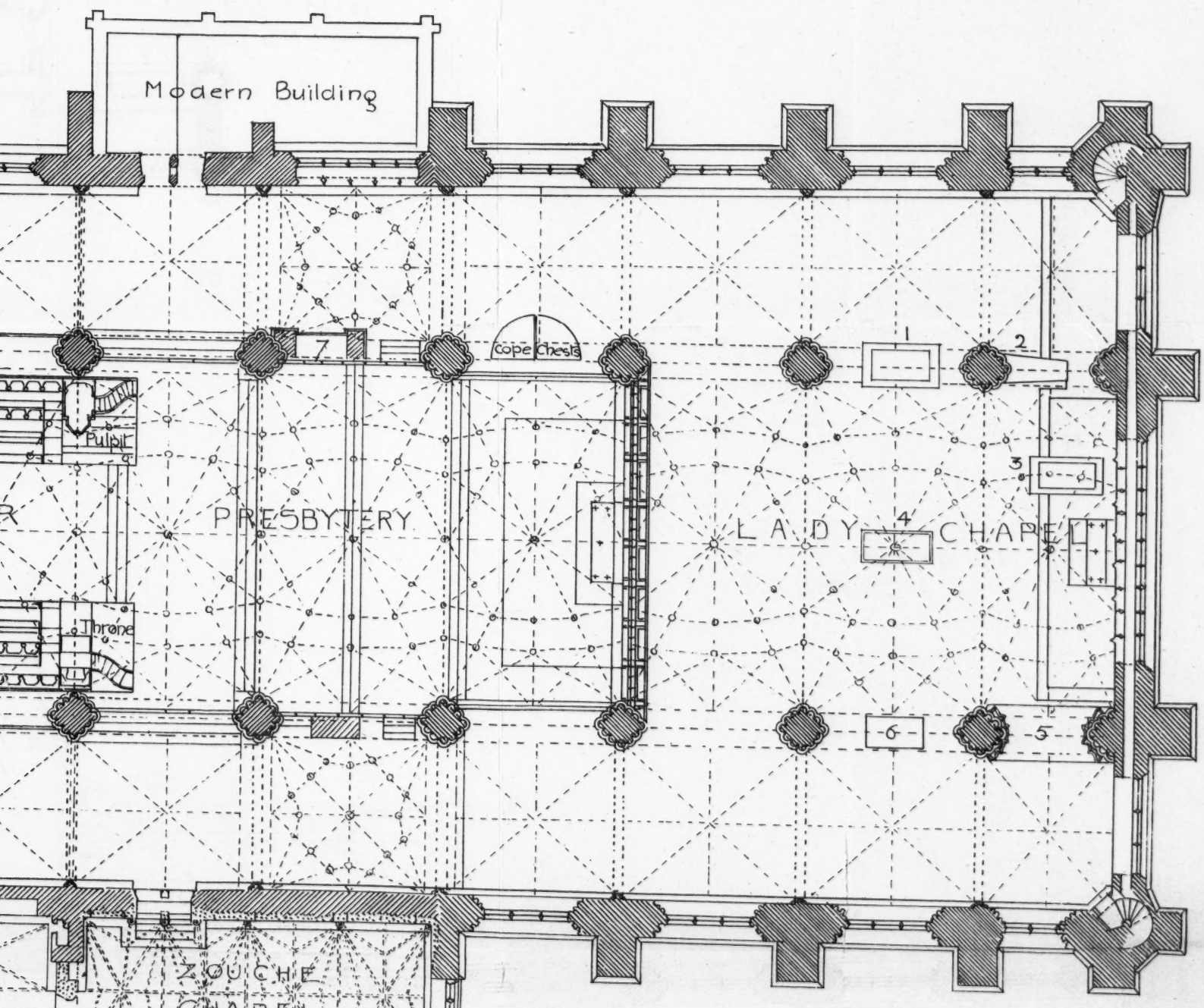

Rbland W. Paul
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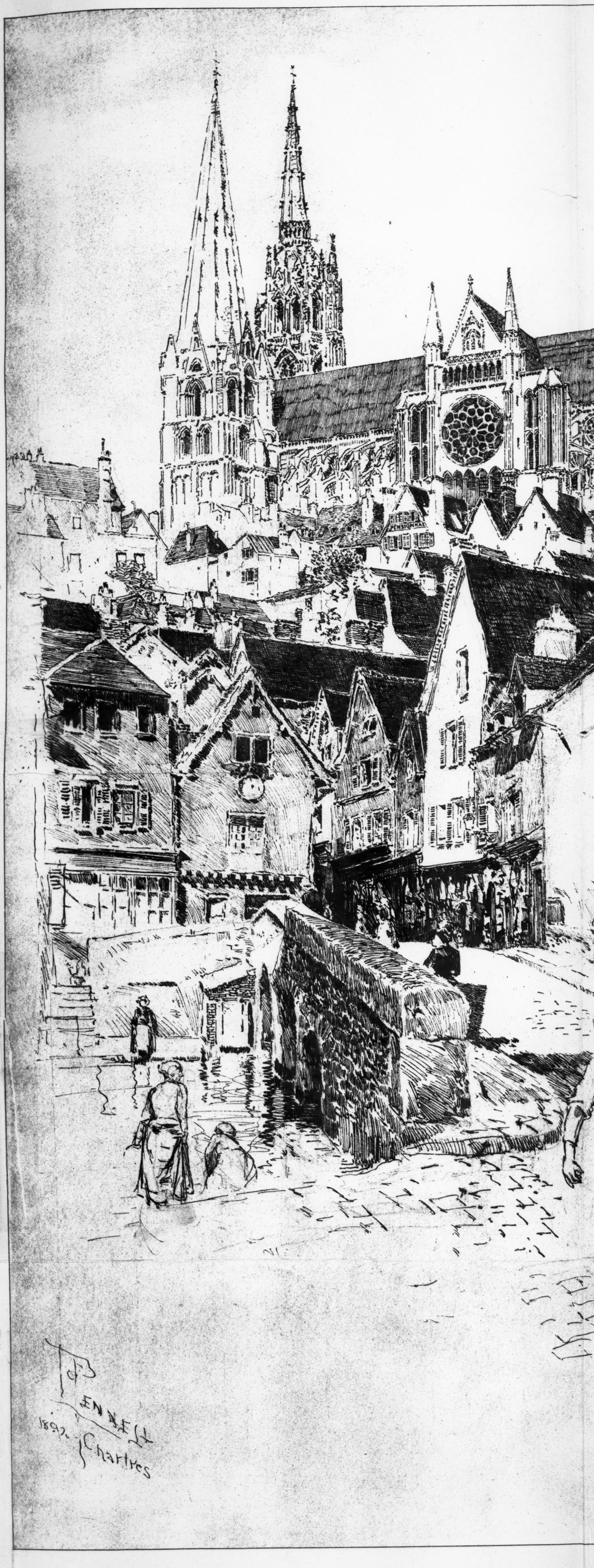

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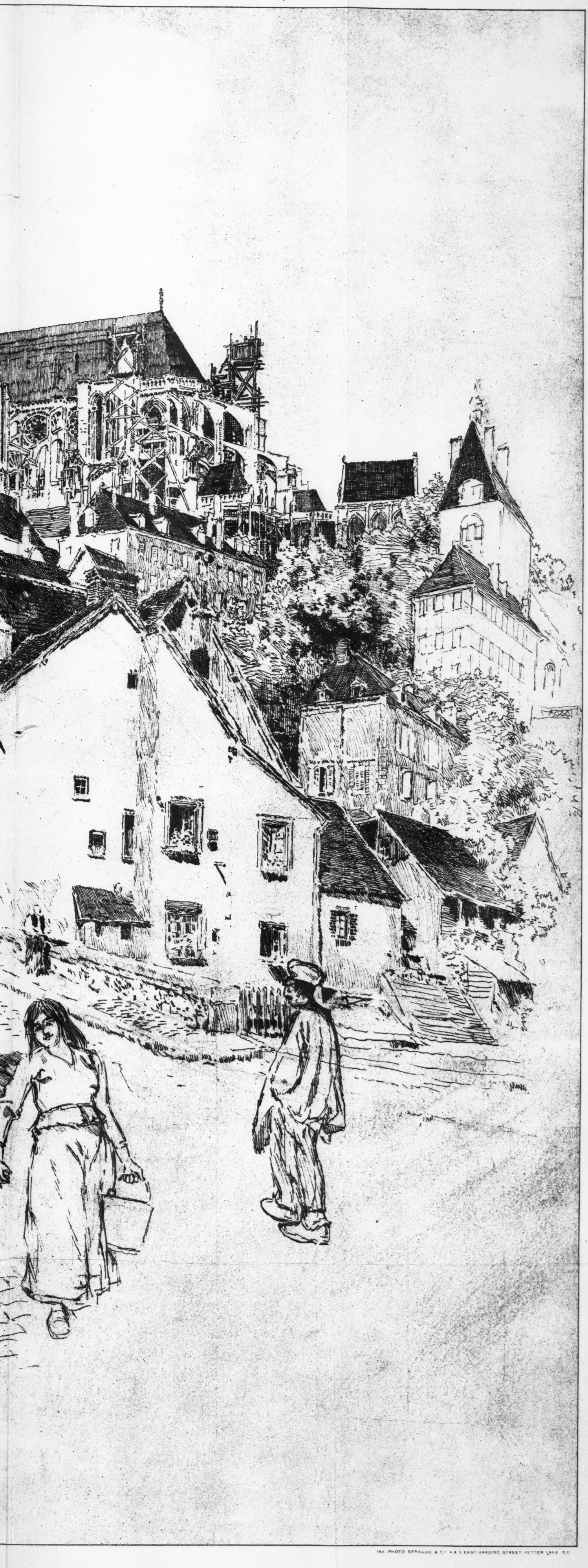

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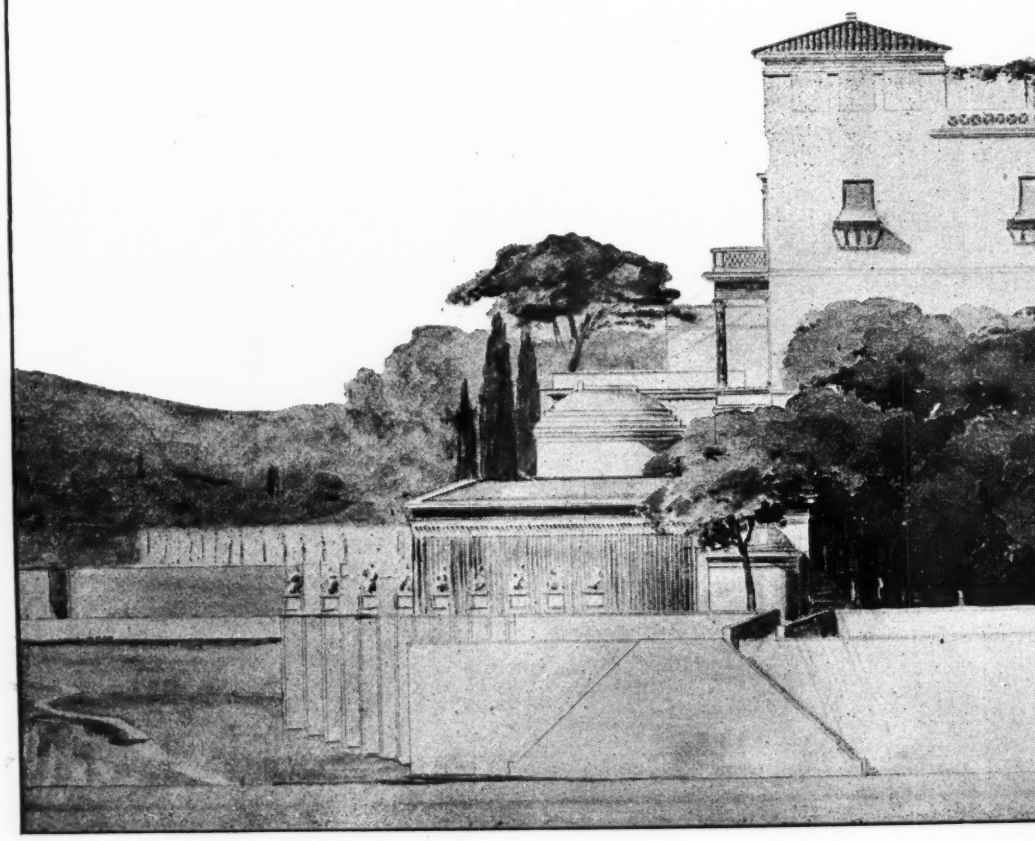
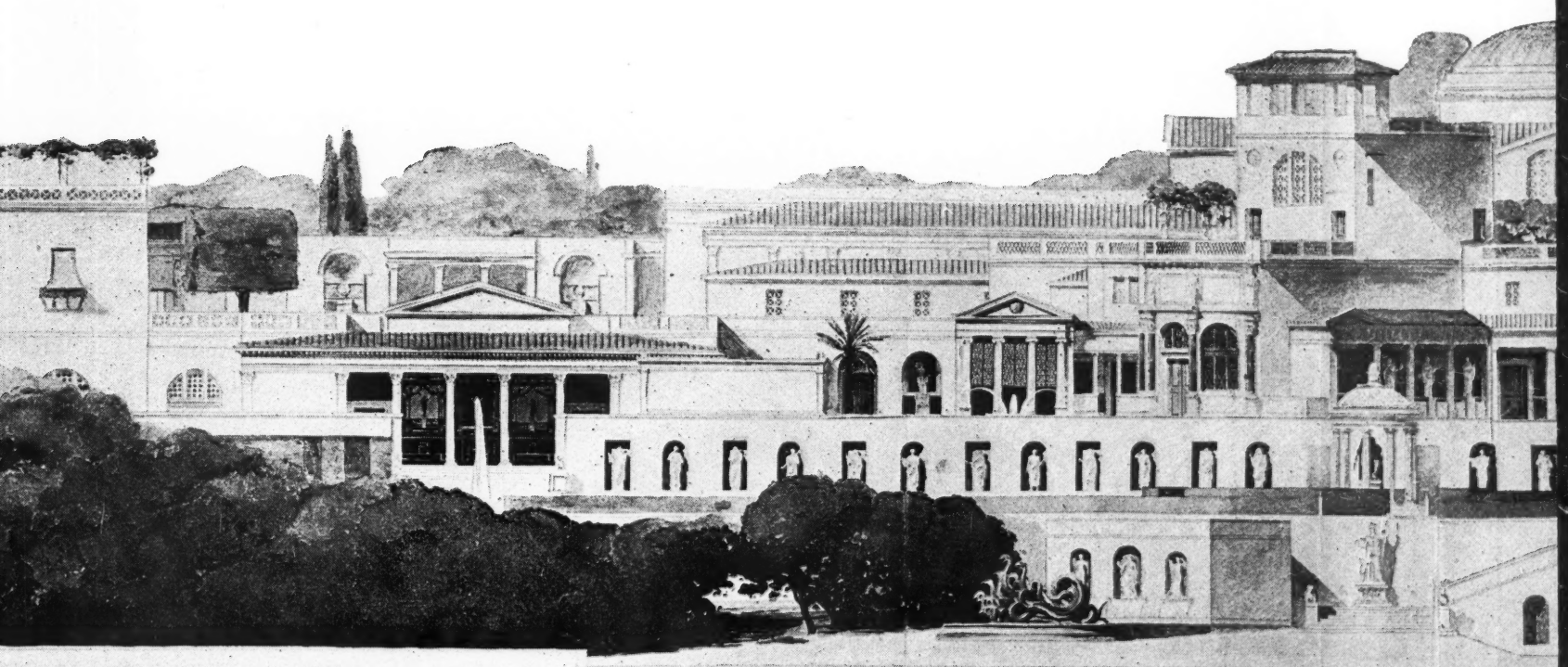
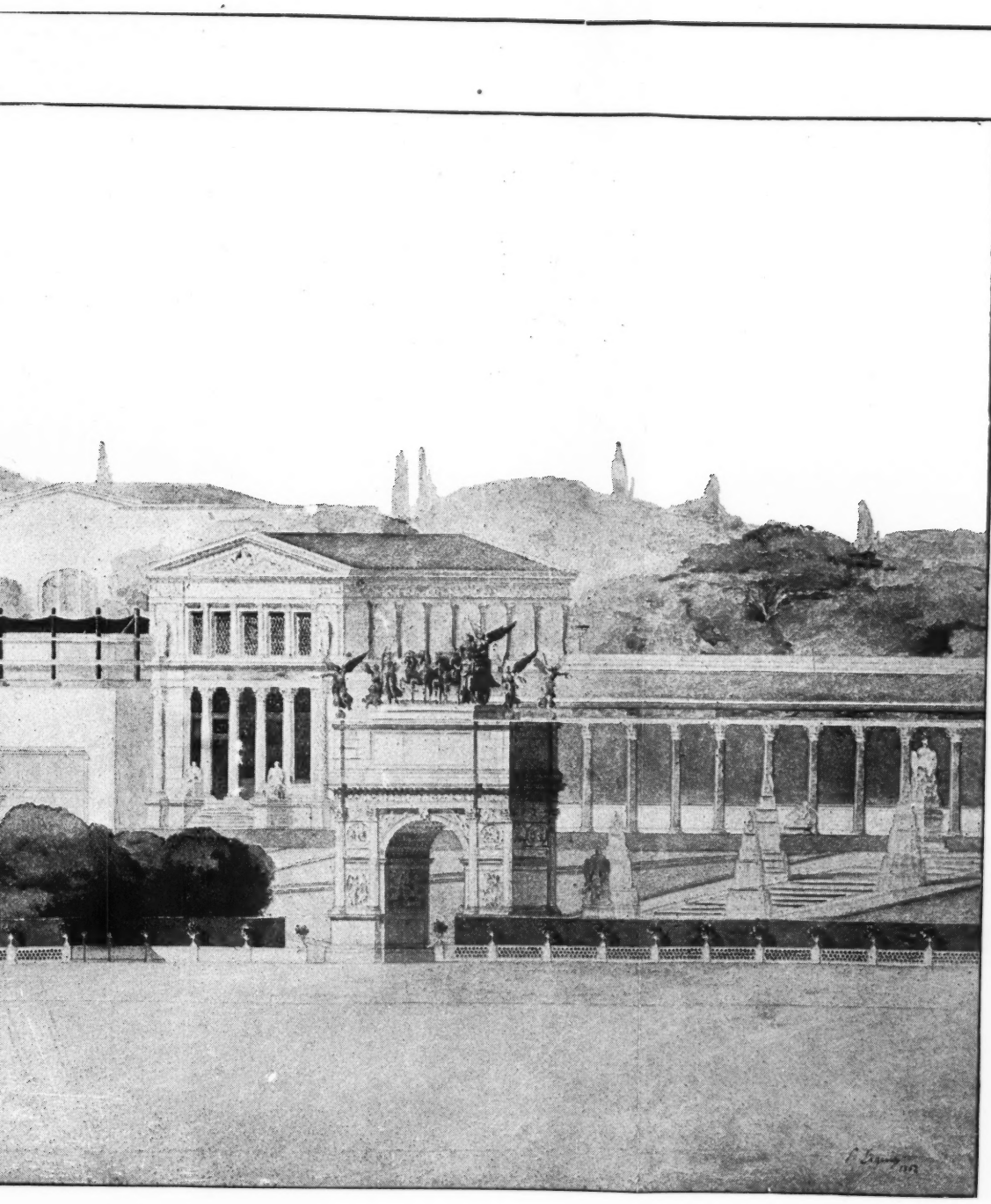




RESTAVRATION DE LA FACADE NORD-OVEST

RESTORATION OF THE VILLA OF HADRIAN AT TIVOLI. THE NORT

HADRIAN AT TIVOLI. THE NORTH-WEST FACE. By M. Pierre Joseph Esquié, Architect.



"THE TREE OF LIFE:" DESIGN FOR MOSAIC FOR THE C

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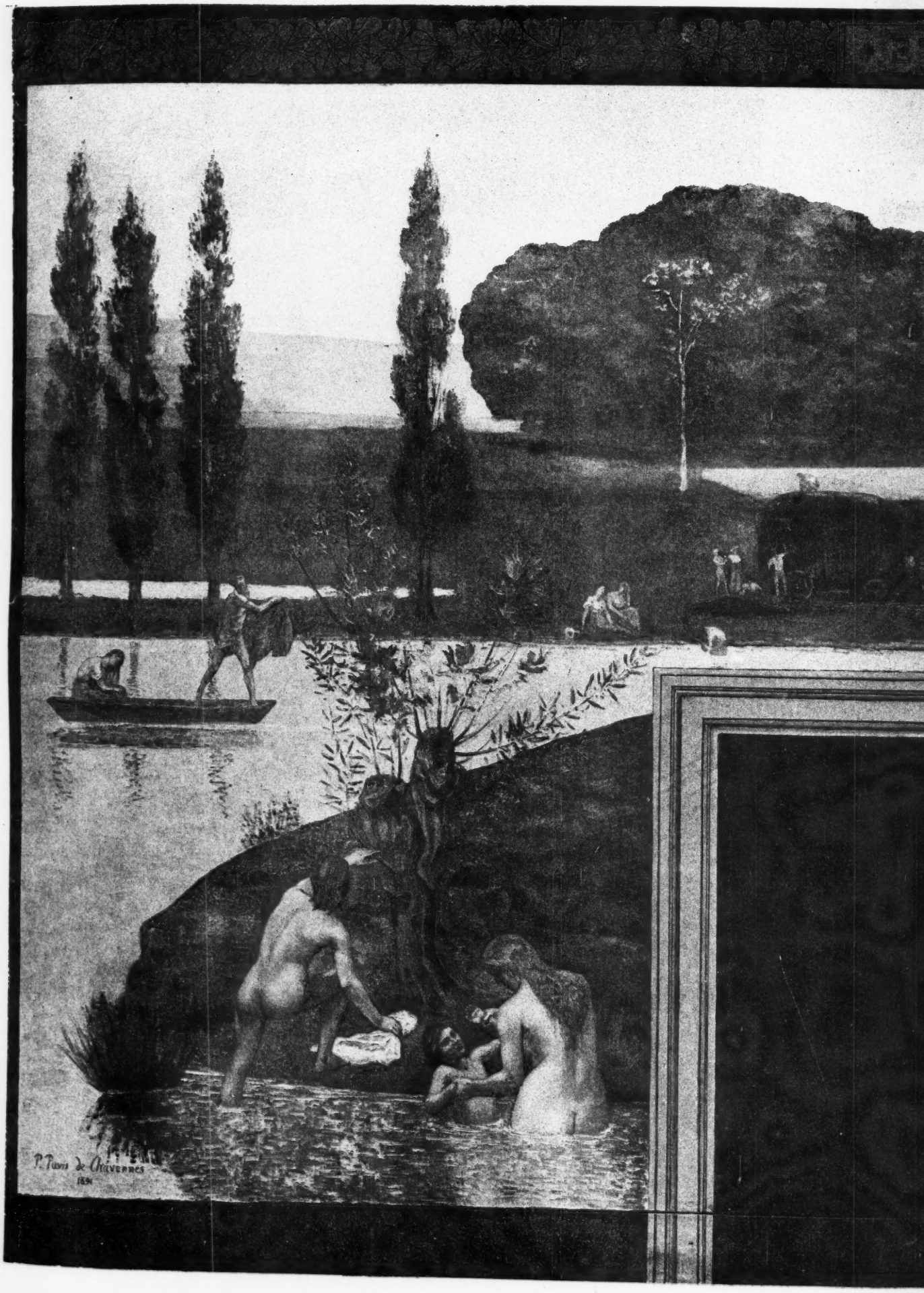
THE CHURCH OF ST. PAUL, ROME.—By Mr. E. Burne-Jones, A.R.A.



"SUMMER": DECORATIVE PAINTING IN THE HÔ

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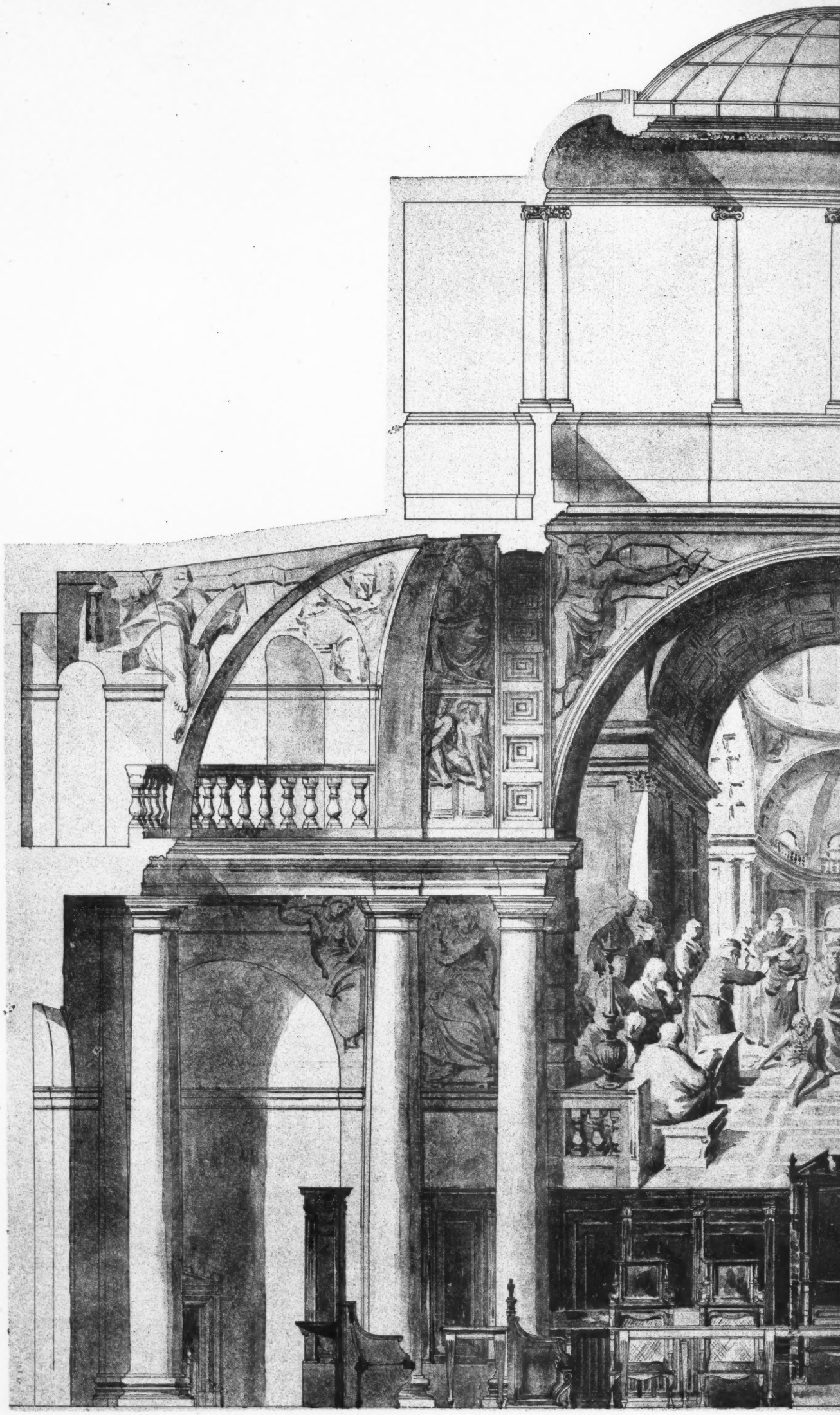
THE HÔTEL DE VILLE, PARIS.—By M. Puvis de Chavannes.

PIANOFORTE: Designed by Mr. T. G. Jackson, A.R.A.



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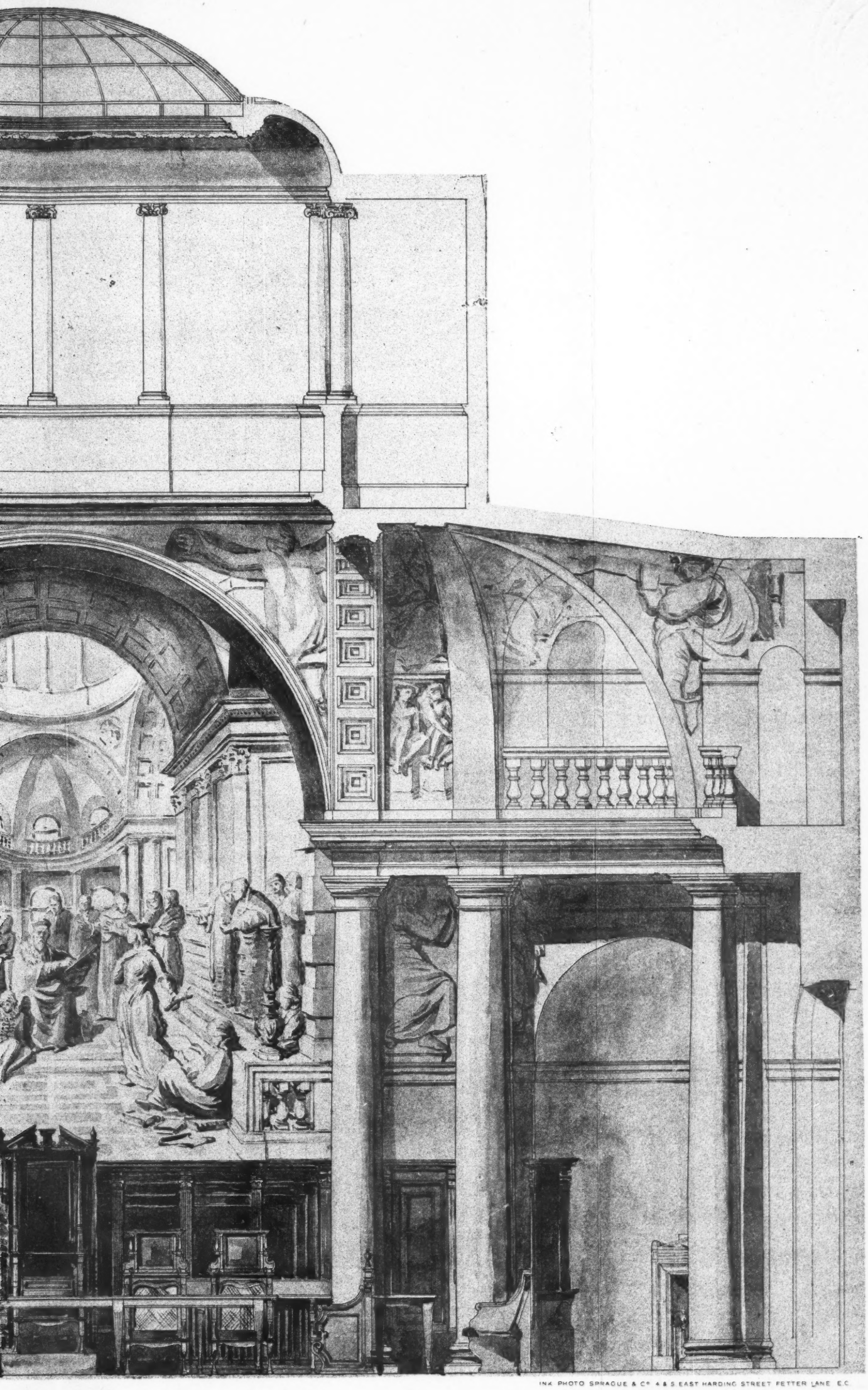

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